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*of the association for physical
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JULY-AUGUST, 1956

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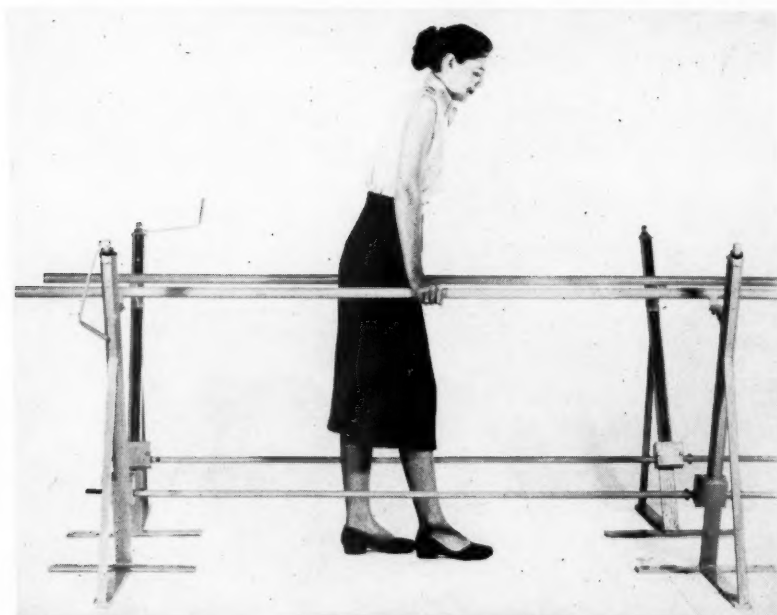
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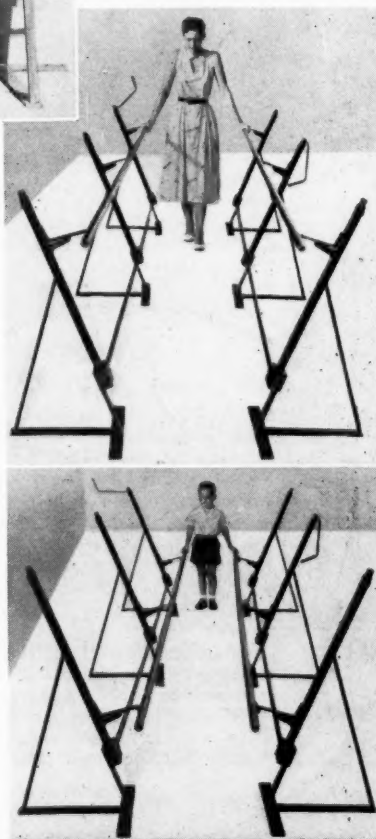
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THE JOURNAL OF THE ASSOCIATION FOR PHYSICAL AND MENTAL REHABILITATION

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REHABILITATION YESTERDAY, TODAY AND TOMORROW— HIGHLIGHTS OF THE AUGUSTA CONVENTION

RAYMOND B. HEASLET*

Panel after panel of distinguished speakers appeared before delegates, members, guests and visitors from all over the United States as the Association for Physical and Mental Rehabilitation observed its Tenth Anniversary in Augusta, Georgia, the week of June 25-29, 1956. The Conference theme, "Rehabilitation, Yesterday, Today and Tomorrow," struck a responsive note as officers, board members, and speakers described the yesteryears of rehabilitation, evaluations of the position today, and the task ahead for the future.

In comparing the association today with its beginnings ten years ago, there is not the usual contrast in picture. We get some contrast in growth of our membership, to be sure; and some in the strength of our organization. Our leadership is good today. It was also good ten years ago. Our greatest change seems to be more subjective—our maturity of outlook. Our high standards, professional growth, and research contributions are evidence of this maturity. This may be of more value to humanity and the profession we serve than the mere acquisition of numbers.

Neither was rehabilitation of yesterday something to be scored as worthless. There were some erroneous concepts, but there were some valid ones. And many speakers on our programs pointed out techniques, procedures, and even drugs of yesterday that are useful, with little modification.

Dr. Harriett E. Gillette, our keynote speaker, said, "The doctor has always tried to rehabilitate his patients." She paid tribute to the early doctors and their patients who developed their own rehabilitative and prosthetic devices. However, she deplored the do-it-yourself devices today. Pioneers did their best with available resources. Our resources today are better. We have more reliable, standard equipment that has met rigid tests for effectiveness and safety. The doctor or therapist who substitutes home-made devices today is not giving his patient the best treatment available.

According to Dr. Gillette, emphasis is shifting from the establishment of more large rehabilitation centers toward the extension of existing centers reaching into all communities, even into the patients' homes. Such decentralization is in keeping with sim-

ilar movements in industry. The Veterans Administration is leading the way in developing a community plan for rehabilitation.

"Tomorrow will be an age of chronic illness and geriatrics," Dr. Gillette said. "There will be more accidents, and drugs will save more of the victims' lives, only to have them living as disabled persons needing rehabilitation."

Dr. Gillette pointed to our maturity in using research findings to help determine whether a patient can be rehabilitated. She noted the direction for tomorrow as being two-fold: (1) to provide means for the patient to rehabilitate himself, (2) to educate the community to accept the disabled.

Following the showing of a film "Out of Darkness," was a symposium on "Low Back Syndrome" presented by a panel of local specialists. Dr. A. Jerome Sparks, Assistant Director, Professional Services, Augusta VAH, was chairman of the panel and spoke of the large monetary loss to the nation from disabilities caused by low back pain.

Dr. S. S. Zintek, Chief, PM&RS at the Augusta VAH, said, "Conservative treatment (for low back pain) has lots to offer." He reviewed the anatomy and physiology of the back, using slides to illustrate etiology and classification of the many types of low back pain. "Patients must be treated mentally, socially and medically," he said. In many severe cases exercises are started in bed, strengthening and lengthening those muscles necessary in effecting better posture.

Dr. Floyd Bliven, Assistant Professor of Surgery and Head of Orthopedics at the Medical College of Georgia, spoke on low back pain caused by structural anomalies. He stated that improper lifting causes many back injuries. If a man attempts to lift, say one hundred pounds, using an improper position, the unfavorable leverage ratio may cause a force of up to 1500 pounds on an intervertebral disc. "Ability to lift depends much on flexibility of the intervertebral discs," he said, "and this flexibility decreases with age." He further pointed out that damage to a disc can be very serious and result in hospitalization and a prolonged period of complete bed rest before muscle relaxation exercises may be begun.

Dr. C. Martin Rhode, Chief Surgeon at the Augusta VAH, gave a summary of the intensive treatment program for low back pain at the hospital and paid

*Executive Assistant, Physical Medicine and Rehabilitation Service, Veterans Administration Hospital, Tuscaloosa, Ala.

tribute to the various members of the treatment team and especially to the various disciplines of the PM&R Service.

The discussion that followed centered around the use of lumbar traction for relief of muscle spasm and the efficacy of ultrasound. It was agreed that lumbar traction had a certain amount of usefulness in many cases, and Dr. Louis B. Newman described an improved technique of applying lumbar traction.

While ultrasound had been found helpful in some disabilities, its value in the low back syndrome was questioned. The only favorable reports were on a few cases of low back pain caused by arthritic involvement. In some instances, proper rehabilitation had dictated that the patient change his job in order to avoid recurrence of low back pain.

Another symposium, "Corrective Therapy and the Incidence of Restraint," was presented the first day of the Convention. Dr. George Arnold, Chief, PM&R Service at Columbia VAH, presided over the panel. He emphasized the effectiveness of exercise and especially therapeutic aquatics in lessening the need for restraint. "I don't believe any hospital is complete without a therapeutic swimming pool," he said. "Even patients subject to seizures are taken into the pool and other exercise activities."

Dr. C. E. Jump, Chief, Continued Treatment Service, Augusta VAH, spoke on "The Incidence of Restraint on the Ward." He defined restraint as depriving a patient of his freedom in order to prevent harm to himself and to others. "The old camisole method of restraint has not been used at Augusta in the seven years that I have been here," he said. "The lessening of restraint now can be attributed to better therapy. We can look forward to its elimination altogether." Its continued use today on a limited basis was attributed to the fact that there are still a few patients who are assaultive and there are some patients who do not tolerate the tranquilizing drugs.

Charles E. Castle, CCT, Chillicothe, presented a paper on "Therapeutic Aquatics and its Effect on Reducing Restraint." There have been no wet sheet packs at Chillicothe since 1952. Active participation in swimming was contrasted to the passivity of wet sheet packs. "Many times, restraint or seclusion serves the needs of personnel applying them rather than the needs of the patient," he said. "Our therapeutic pool is used every hour of the day from 8:00 a.m. to 9:30 p.m." The best size for pools is 15 by 35 feet; temperature of water 92 degrees. The patient usually spends from one to two hours daily in the pool. Mr. Castle mentioned that various types of music have been used and that soothing music is the most preferable.

A paper "Gym Activities and Their Effect on Re-

ducing Restraint" was given by Paul E. Beck, CCT of Augusta. In using gym activities to make the patient available earlier for treatment by the psychiatrist, we are helping to shorten his length of stay in the hospital, thus reducing costs. "Corrective Therapy is the extended arm of the doctor," Mr. Beck said. "It assists the psychiatrist in the treatment of disturbed patients." Gymnastics must not be considered as a complete treatment program, but as a part of the treatment program. There is a seven day program for disturbed patients operating twelve hours a day. Need for restraint has been reduced 65% following the intensive corrective therapy program according to the speaker.

The convention was officially opened Tuesday afternoon with Invocation by Chaplain Augustus C. Summers, Lt. Col., U. S. Army. Mr. Thomas Beckham, Special Assistant to Mayor Hugh L. Hamilton, welcomed the Convention to Augusta, "the fastest growing city in Georgia with a population of from 95 to 100 thousand." "In 1950 we had from 12 to 15 conventions a year," he said. "today we have 100 or more." The Talmage Memorial Hospital was mentioned as the city's latest contribution to medical science.

Dr. Joseph L. Mulherin, President, Richmond County Medical Society, gave the Society's welcome to the convention and saluted Corrective Therapy for its past accomplishments, expressing hopes for its continued success. Dr. Rufus Payne, Superintendent of the Talmage Memorial Hospital, and Dr. L. R. Tighe, Manager, Augusta VAH, added their welcomes. It was considered appropriate that an organization such as ours, devoted to medical treatment, should choose for its annual convention, a city like Augusta with a modern medical center.

Frank S. Deyoe, Jr., CCT, President of the Association, responded to the welcome and expressed thanks to the Bon Air Hotel and the Chairman and members of the Program Committee. Dr. Gillette then gave the keynote address (reported elsewhere in this article).

The first lecture following the ceremonies opening the convention was "Trends in the Treatment of Neuropsychiatric Patients with Tranquilizing Drugs" by Henry A. Brandt, Chief, Psychiatric Service, Augusta VAH. He noted that snake root was used 30 centuries ago and the modern tranquilizing drug is merely a crystalline derivative. In the 16th Century Rauwolf went to India and was given credit for the discovery of snake root, a fact which had been overlooked until recently. It is not the first time that we have overlooked a worthwhile drug. Digitalis is a good example.

Dr. Brandt observed that the universal accept-

ance of tranquilizing drugs is following the characteristic pendulum swing of popular trends. Comparison was made with Freud's psychoanalysis which in its early history was slow in gaining approval. The pendulum of approval is now swinging so far in favor of the tranquilizing drugs that perhaps, even now, they are being used far beyond their effectiveness.

The drug seems to act on the lower brain or seat of emotions without affecting the cortex or higher levels. Early treatment of acute mental illness is important if we are to get good results. Studies show that Reserpine is effective in the treatment of hebephrenic patients and Chlorpromazine with the paranoids. Early treatment is emphasized by national statistics which show that during the first year of hospitalization a patient's chance of discharge are about 50-50. During the second year his chances drop to one in 16, and after 8 years to one in 100. These figures all reflect conditions before the advent of tranquilizing drugs. What they are now we do not know.

The toxicity of the drug is not very well known. Certainly we must be careful in its administration, but there is on record a case of a child accidentally taking 800 times the adult dose and surviving.

Psychiatric contributions to prevention of disability were discussed by Dr. John M. Caldwell, Chief of Psychiatry, Medical College of Georgia. He gave a comparison of figures on emotional disorders during WWI, WWII and the Korean conflict showing that psychiatry has made great advances in treatment procedures. "There are multiple etiological factors in emotional and personality disorders," he said. "Man doesn't remain constant in his emotional balance. He fluctuates." He is subjected to numerous stresses and these are counteracted by "supports" such as morale, religious faith and esteem. Different kinds of stresses occur at different developmental stages and the emotional support to counteract these stresses must also differ.

Dr. Caldwell accepted the validity of the adage, "early treatment prevents disability," but doubted if psychiatrists could ever be numerous enough to give professional treatment to everyone as soon as early symptoms develop. Said he, "The job of prevention is not the sole province of psychiatry, or even of medicine, but must be accepted by many disciplines."

Dr. Maurice Dunn, Director, Professional Services, Augusta VAH, was chairman of the symposium: "Multidisciplinary Conferences and Total Rehabilitation of the Patient." Dr. Dunn gave the case history of a very difficult psychiatric patient and the part each of the team had in his rehabilitation. This was followed by descriptions of the function of various services within the hospital—Social Service, Psychology,

PM&RS, Special Services, Nursing Service and Vocational Rehabilitation—by representatives from these various segments of "the team."

Dr. Ernst Jokl, Director, Kentucky Rehabilitation Center, University of Kentucky, spoke in interesting fashion on "The Contribution of Rehabilitation Research to the New Clinical Concept of Cardiovascular Physiology."

Among the points mentioned by him is that of the possibility of maintaining a high standard of physical efficiency in middle aged and old people through continuation of training. He referred to results obtained in recent studies with 2,000 old (40-48) gymnasts in Germany, and to the analysis of the data of the 1952 Olympic Games.

Similarly, a critical evaluation of athletic performances by women reveals the extent to which hitherto undeveloped resources of adaptation are now being utilized. The term "weaker sex" can no longer be applied to women without qualification.

Referring to assertions that maximal physical effort represents potential danger to the normal heart, Dr. Jokl stressed that such fears are unjustified by the facts as we know them. The normal heart is invulnerable to exercise.

In developing physical endurance optimally, new knowledge has become available from the study of athletic training. For example, the great Finnish long distance runners supplement their exercise and track practice by the customary hot steam bath (Sauna) followed by exposure to cold water or snow. In other words, the heat regulating mechanism of the body aids physical endurance beyond the specialized physiological region so far attributed to it.

"Rehabilitation—A Different Point of View" was the subject of Mr. Eugene E. Speer's talk. He related his early experiences as a field supervisor in medical rehabilitation and spoke of the ingenuity shown by corrective therapists in devising new equipment. One of our cherished concepts of rehabilitation is the lower cost of rehabilitation beds compared to the cost of regular hospital beds and this is true, so far as it goes. But the total cost is increased according to Mr. Speer. If the convalescing patient is removed earlier from the hospital bed and replaced by an acutely ill patient, the cost of maintaining that same hospital bed, now occupied by an acutely ill patient, will go up—and we still have to pay for the reduced cost of the rehabilitation bed. Mr. Speer gave a favorite quotation: "The greatest prayer you can send to God is the greatest service you can give to man."

Human relations in corrective therapy were discussed by Ray Heaslet, Executive Assistant, PM&R Service, Tuscaloosa VAH. The fact that corrective

therapists work almost entirely with people—patients and other therapy personnel—make human relations of utmost importance to this group. "The degree of success of a work unit," Mr. Heaslet said, "is measured by the degree of cooperation existing among all the members of the unit."

"Photoresistance in Bacteria" was the subject of a report on scientific research by Dr. Folke Becker, Chief, PM&R Service, Dublin VAH. Dr. Becker noted that some earlier observers had concluded that repeated ultraviolet radiation generally resulted in increased resistance in bacteria. He gave a detailed report of a very exacting experiment which he and an associate conducted which did not verify these findings at all.

"A Demonstration of Three Techniques for Post-laryngectomy Speech" was given by Dr. Neil W. Coppinger, Chief, Psychology Training Unit, Augusta, VAH, and one of his patients. The patient demonstrated the mechanical reed type of speech and Dr. Coppinger demonstrated the electric buzzer type and esophageal speech. The latter was admittedly the more difficult to learn, but was considered the more desirable since no mechanical or electrical devices are used.

A symposium on "The Varied Potential of Corrective Therapy" was chaired by Dr. Louis B. Newman, Chief, Physical Medicine and Rehabilitation Service, Veterans Administration Research Hospital in Chicago.

Our goals for neurologic patients must be realistic, said Dr. Henry A. Brandt, Chief, Psychiatric Service, Augusta VAH. Dr. Brandt recalled his part at the making of the VA film, *The Journey Back*. "A patient with a cerebro-vascular accident has a terrific chance for a good recovery if reached early by corrective exercise," he explained. "Many times the corrective therapist must not only be responsible for exercise, but may have to fill in for other disciplines, such as speech therapy. The corrective therapist sees the patient daily and should be alert to report any noted changes to the physician. He should also teach the patient and relatives those exercises that can be done after discharge.

"To whatever extent the schizophrenic patient has regressed, the corrective therapist can adapt a physical activity through which he can find expression," said Dr. C. H. Reagan, Chief, PM&R Service at Tuscaloosa VAH, in a paper which was read in his absence. Dr. Reagan identified several possible objectives for corrective therapy for psychiatric patients when prescriptions are of a general nature lacking specific objectives.

A detailed report on breathing exercises for pulmonary patients was given by Willis P. Denny, C.C.T.

of Dublin VAH. "Good orientation is needed so that the patient himself is sold on the idea and will voluntarily carry on the exercises both on the ward and later on, in his home," Mr. Denny said. "The patient can be taught to breathe rhythmically and fully rather than rapidly and shallowly."

"The fat person literally eats himself into the grave," said Dr. Joseph G. Bohorfoush, Chief, Medical Service, Augusta VAH. He presented a paper on "Corrective Therapy in the Treatment of Cardiac Cases." He said that it was very easy in this country for a person to gain weight. Dr. Bohorfoush's own personal rule is to determine his weight figure, then check his weight twice weekly on bathroom scales. Whenever the scales show as much as two pounds gain, he goes on a strict diet until the weight is down again.

Dr. Bohorfoush supported the statement by Dr. Jokl that "the normal heart is invulnerable to exercise." He said that exercise sufficient to prevent emboli, contractures and freezing of joints, will never hurt the patient. Latest figures show that only about 30% of rheumatic fever cases develop heart disease. Cardiac capabilities are more important to remember than cardiac limitations. "We now tell the heart patient what he *can* do," he said. "The role of the corrective therapist is to determine how much the cardiac patient can do and teach him how to do it." In stressing the importance of exercise in making the work of the heart easier, he used the analogy of an electric motor trying to pull a rusty machine as contrasted to the same motor pulling a well oiled machine.

Exercise is still important in myocardial insufficiency (failure in old age), Dr. Bohorfoush explained. In myocardial infarction it is extremely important to prevent frozen shoulders and corrective therapy is especially effective in such prevention. It was noted that the incidence of myocardial infarction is higher among white males than among white females but about equal between the sexes among negroes.

"Emotional conditions causing cardiac symptoms are frequently more disabling than organic lesions," he said. "These patients must gain something by being ill. They are most difficult to treat. The psychiatrist, cardiologist, and internist must work together and understand each other in such cases. At any event the patient must be told positively that he has no heart disease!"

Further emphasizing the role of exercise in all heart cases, Dr. Bohorfoush said, "I do not believe that a method of treatment (lying still in bed for three weeks) that will harm a healthy man, is going

to cure a sick man." Corrective therapy is a prime tool in treatment of cardiac cases.

Dr. A. B. C. Knudson, Director, PM&R Service, VA Central Office, discussed "National Trends in Physical Medicine and Rehabilitation." Dr. Knudson deplored the phrase, "rehabilitation is everybody's business," not because it is untrue, but because it implies that specialists are not needed. The speaker emphasized the importance of trained leadership in rehabilitation.

Dr. Knudson traced the development of physical medicine and rehabilitation and the important part corrective therapy has played in this development. The specialty has now spread into civilian centers and into industry. Industry has demonstrated a willingness to employ the disabled if they are properly placed.

"Auto, farm and home accidents are increasing, emphasizing the need for more community rehabilitation centers," Dr. Knudson said. He paid tribute to pioneers in the field and especially to the contributions of Dr. Louis B. Newman. He noted sadly that we are erecting rehabilitation buildings faster than we can staff them. We have some fine buildings that are idle because of no staff.

We are making some progress, though not fast enough. Colleges of medicine are increasing their curricula in Physical Medicine and Rehabilitation. There are more residencies for specialists in PM&R and also affiliation training for the various therapy disciplines. The directors of our O.T. and P.T. Schools are now physicians. Dr. Knudson predicted that the future will see more emphasis in PM&R on the care and treatment of the aged. He recommended a film distributed by Pfizer Laboratories on "Care of the Aged."

"An Area Medical Director Views Corrective Therapy" was the subject of an address by Dr. John R. Hood of Columbus, Ohio, VA Area Medical Director. "The concept of bed rest is declining," he said, "and the concept of corrective therapy is increasing." He commented at length on the favorable results of exercise therapy for cardiac patients. "The psychological implications of illness should continue to be emphasized by corrective therapists," he said. He urged the need for further research and the advantages of a wide variety of training, such as the training offered at this Convention.

Mr. A. Polk Jarrell, Director, DVR, State of Georgia, delivered the main address on Awards Night and urged the APMR and its individual members to use their influence in getting the States to appropriate their share of P.L. 565 money. He spoke of the need for more rehabilitation centers. The DVR of

Georgia refers patients to the Gillette Clinic and the Warm Springs Clinic but must still refer many cases to the New York Institute of Rehabilitation and the Woodrow Wilson Center in Virginia. "Recent advances in Physical Medicine and Rehabilitation," he said, "have made it possible to place in employment many more of the seriously disabled."

A program of short papers was presented by Mr. John M. Baxter, Chief, Industrial Therapy, Augusta VAH., Mr. Paul E. Roland, Research Training Specialist, Chillicothe VAH., Mr. John B. Murphy, CCT, Chillicothe VAH., and Mr. James M. Field, CCT, Durham, VAH.

Mr. Baxter stressed the importance of Industrial Therapy as one of the disciplines of PM&R and stated that this therapy is prescribed just as any other and progress notes made on individual observations of the patients.

Mr. Murphy gave an interesting paper and demonstration of public relations in corrective therapy. He exhibited a series of colored slides with recorded explanation depicting the activities of corrective therapy. These were made for the public and had been used on the local Hospital Day Program.

Mr. Fields presented a report on a difficult rehabilitation case in arsenic intoxication. The case was complicated by age of the patient (63), history of a heart condition, obesity with high blood pressure, and a cerebrovascular accident ten months previous to admission. A program of corrective therapy was described which, initiated after discouraging results with all previous therapy, slowly effected a degree of rehabilitation and self-care.

A relaxation and motivation program for chronic schizophrenic patients was described by Paul Roland, who also related the historical development of the "Roland Technique." This technique had earlier received favorable evaluation from the Menninger Foundation, and just recently has been favorably evaluated by a special Research Conference of Non-VA experts. The treatment program developed the past eight years has been for the purpose of reaching patients that are so inaccessible that all the ordinary approaches fail to arouse their interest to the extent that they can participate in activity therapy.

In drawing a picture of the future of corrective therapy, Dr. John E. Davis, President-elect, related outstanding advances that have been made in medicine in recent years, especially in psychiatry. "Many more developments are on the threshold," he said, "and the next few years should see even more outstanding advances." He repeated Meyer's prediction that organic illnesses having a physical basis will be

(Cont'd on Page 135)

ASSISTIVE DEVICES FOR AMBULATION

LOUIS B. NEWMAN, M.E., M.D.*

NORMAN N. TENNER, B.E.**

There have been numerous excellent assistive devices^{1,2,3} developed and described over the years to aid the disabled person to perform self-care and daily living activities. Without some of these devices many of these individuals would be helpless—and perhaps hopeless. The authors have developed and used for a number of years several devices, two of which will be described. Useful primarily in ambulation training, they are, a hand support device used in conjunction with parallel bars and a set of adjustable guide-rails which are attached to parallel bars for patients with neurological disorders (hemiplegia, quadriplegia and paraplegia), lower extremity amputations, rheumatic diseases and others.

Hand support devices for parallel bars

In those patients whose disability results in an inability to grasp the handrail on parallel bars, a simple assistive splint has been devised. The device consists of a curved metal member which is attached to a metal cuff (Figs. 1 and 2). The curved portion fits into the palm of the hand, the entire device being held in position by means of an adjustable padded strap. With this device the patient is able to keep the involved hand and upper extremity in proper position on the parallel bars, and at the same time to support the wrist in the best position. With the hand properly positioned in this assistive device, flexion contractures of the wrists and fingers can frequently be prevented. If contractures are already present this device will be of assistance in correcting them.

The patient is thus able to slide his hand along the parallel bar reciprocally with the opposite arm while attempting ambulation. Inasmuch as the curved metal portion of the device fits loosely on the parallel bar with very little effort as friction is reduced to a minimum (Fig. 3). When the patient has walked to



Fig. 1

Assistive hand support device on patient's left hand and wrist and placed on the parallel bar hand rail.



Fig. 2

Semi-underside view of the assistive hand support device with attached adjustable padded wrist strap for the left hand.

¹*Self-Help Devices for Rehabilitation*, Institute of Physical Medicine and Rehabilitation, New York University—Bellevue Medical Center, New York, N. Y.

²*A Manual of Cerebral Palsy Equipment*, National Society for Crippled Children and Adults Chicago, Ill., 1950.

³Newman, L. B., Special Hand Splints for the Disabled, *Archives of Physical Medicine and Rehabilitation*, 28:770, 1947.

⁴Newman, L. B., The Role of Physical Medicine and Rehabilitation in Chronic Medical Diseases, *American Practitioner and Digest of Treatment*, Vol. 7, No. 1, January, 1956.

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**Chief, Corrective Therapy Section, Veterans Administration Research Hospital, Chicago, Illinois.



Fig. 3

Patient walking in parallel bars with assistive hand support device on rail and adjustable guide-rails in place to aid in proper gait pattern training. The guide-rails are adjustable in both the vertical and horizontal positions.

the end of the parallel bars, the arm can be lifted actively, or assisted by the opposite arm, onto the other rail when the patient turns about to walk in the reverse direction. This device is particularly helpful for hemiplegics as well as for partial quadriplegics

who are unable to grasp the parallel bars or lack sufficient strength or coordination to slide the hand along the bar. In arthritis with hand involvements, this device is also quite helpful. The device is made for both the right and left hand and can be fabricated of plastic material instead of metal.

Guide-rails for parallel bars

As a further aid in ambulation, adjustable guide-rails that are attached to the parallel bars have proved quite helpful and satisfactory (Fig. 3). The guide-rails are easily adjustable in both horizontal and vertical positions. In patients with neurological disorders, lower extremity amputations, and certain orthopedic conditions, an undesirable gait pattern frequently develops with circumduction and excessive abduction of the involved lower extremity. By adjusting the guide-rails to the proper vertical and horizontal positions, the patient's extremity is guided through a more normal pattern of movement. The inner surfaces of the guide-rails are covered with smooth plastic or other material so as to minimize the amount of friction between the patient's leg or artificial extremity and the rail.

In those disabled persons who have spastic adduction of the lower extremities resulting in a "scissoring gait", an adjustable removable vertical guide-rail, as described and used by many for a considerable number of years, can be attached over the white line on the center of the floor of the parallel bars as a further aid in ambulation (Fig. 3).

Acknowledgement

The authors are grateful to the Medical Illustration Service at the Veterans Administration Research Hospital, Chicago, Illinois, for the excellent photographs, and to the Prosthetic Appliance Unit and the Engineering Division at the Veterans Administration Hospital, Hines, Illinois, for the construction of the devices described in this article.

VA NAMES NEW SURGICAL DIRECTOR

Dr. John A. Kennedy has been appointed director of the surgical service in Veterans Administration Central Office at Washington, D. C., VA announced.

Dr. Kennedy succeeds Dr. Paul M. Ireland who has become manager of the hospital at Ann Arbor, Michigan.

Joining VA in 1930, Dr. Kennedy has served in VA hospitals at Palo Alto and San Francisco, Calif.; Dayton, O.; Huntington, W. Va., and Mt. Alto in Washington, D.C.

During World War II, Dr. Kennedy served with the Navy in the rank of lieutenant commander in the South Pacific.

From 1946 to 1949, Dr. Kennedy engaged in private practice in Washington, D.C. He returned to VA in 1949 and has been in the office of the director of surgical service since then.

Dr. Kennedy was born in the Philippine Islands, the son of a U.S. Army officer. He received his college and medical education at Georgetown University in Washington, getting his M.D. degree in 1929.

He interned one year at Georgetown Hospital, followed by preceptorship in surgery at the VA hospitals in Palo Alto and San Francisco.

Dr. Kennedy is a Fellow of the American College of Surgeons, and a member of the American Medical Association, the Medical Society of the District of Columbia, and the Georgetown Clinical Society.

EVALUATE RELAXATION AND MOTIVATION THERAPY PROGRAM AT VAH, CHILLICOTHE, OHIO.

A conference to enlist the services of non-VA experts to provide counseling and guide lines to the agency regarding the treatment potential inherent in special programs such as the Relaxation and Motivation Therapy program, was held at the VA Hospital, Chillicothe, Ohio on March 26, 27, and 28.

The primary purpose of the conference was to develop principles of treatment in the program and suggestions on using hospital personnel more effectively in treating chronically ill mental patients.

Participating in the conference were the following: Dr. Eliot H. Rodnick, Chairman, Department of Psychology, Duke University; Dr. John M. Hadley, Director, Graduate training in Clinical Psychology and Clinical Services, Purdue Univ.; Dr. John E. Davis, former Chief, Corrective Therapy, Veterans Admin.; J. Elliott Janney, Partner in the industrial consulting firm of Rohrer, Hibler and Replogle, Cleveland, Ohio; Dr. David McK. Bloch, Director of Neuropsychiatry, Walter Reed Army Institute of Research; Dr. M. Erik Wright, Director of Clinical Services, Psychological Clinic, Univ. of Kansas and Dr. George A. Kelly, Professor of Psychology; Dr. John R. Kinzer, Professor of Psychology; Dr. Julian B. Rotter, Director Psychological Clinic, and Dr. Dwight M. Palmer, Professor of Neurology, all of Ohio State Univ.

CAN HE WALK?

LEWIS A. LEAVITT, M.D.*

JOHN J. ARENA, M.Ed.**

The purpose of this article is to disseminate information about adapted devices used at the Veterans Administration Hospital, Houston, Texas which have been found to be beneficial in mobilizing the quadriplegic patient with incomplete paralysis. Not all of these devices are of equal importance or of equal value nor is it to be inferred that all patients can use the devices effectively. The techniques as described by Dening, Deyoe and Ellison¹ form the basis of the treatment program.

The quadriplegic patient is not usually considered a good candidate for functional ambulation due to the partial involvement of the upper extremities and the over-all physical demands which ambulation makes upon the patient. However, each patient is carefully evaluated by the medical staff. The initial treatment program may include bed exercises, muscle re-education, electrical stimulation, Hubbard tank, standing bed, functional activities for the upper extremities, and other exercises prescribed in the Physical Medicine and Rehabilitation Service to improve over-all physical condition. The patient's progress is followed closely and when it is medically feasible, he is referred for a program of "elevated activities," which are accelerated in keeping with his physical tolerance and rate of improvement. It is during this "elevated activities" phase of treatment that adapted equipment has proved helpful in mobilizing the patient. These adaptations and modifications to equipment are made under medical guidance and are based on knowledge and/or experience of what can be done.

Elevated activities usually begin in the parallel bars. This is considered as part of the evaluation for the feasibility of fitting the patient with braces. It is during this phase of activities that the first adapted equipment is utilized. This is a knee board for stabilization of the knees, with a belt around the pelvis to stabilize the hips. The device is shown in Fig. 1.[†] The use of the knee board allows the patient considerable freedom to shift weight and to practice standing balance. He can perform "setting" of the trunk musculature.

It also encourages mobilization of other musculature; for example, the patient is encouraged to use the upper extremities in the parallel bars—such use usually increases the strength and mobility of the arms and shoulders.

Standing activities are beneficial for other physiological purposes. Weight bearing tends to slow down decalcification of the long bones of the lower extremities and to slow down the undesirable high concentration of calcium in the urine².

Obviously, functional ambulation of these patients varies with the degree of neuromuscular involvement. To meet the varying needs the invalid adult crutch walker was modified (Fig. 2). It is utilized almost routinely with such patients. Using this walker, the patient is allowed to stand and with some assistance can usually move along.

The manner in which the walker is modified makes it possible for the patient and/or the therapist to control it. Once placed in the walker, the patient is able to assume a position of rest quickly and easily. Spring attachments to the lower extremities assist in the walking process. As the walker is forced forward the increased tension on the spring assists the patient in taking a step. Because of the fixed front wheels, the walker moves in a straight direction and the patient can focus his attention on stepping rather than on controlling the walker. With the forearm rests, the patient can be placed in a good postural position which can be maintained with minimal assistance.

With this modified walker it is easier to mobilize the patient. This mobilization provides encouragement and motivation.

In order to prevent false hope of complete functional ambulation and to maintain the patient within his physical limitations, it is highly important to make

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**Chief, Corrective Therapy, Veterans Administration Hospital, Houston, Texas.

¹Dening, K., Deyoe, F. and Ellison, A. *Ambulation: Physical Rehabilitation for Crutch Walkers*, New York, Funk and Wagnalls Co., 1951.

²Bierman, W. and Licht, S., *Physical Medicine in General Practice*, New York: Paul B. Hoeber, Inc., 1952, p. 481.

[†]EDITOR'S NOTE: For a description of a somewhat similar device, see Baldino, J. and Tauber, A., A Progressive Approach to Ambulation for Patients with Peripheral Paralysis, *Journal of the Assoc. for Phys. & Mental Rehab.*, 9: 1: 8, Jan., 1955.

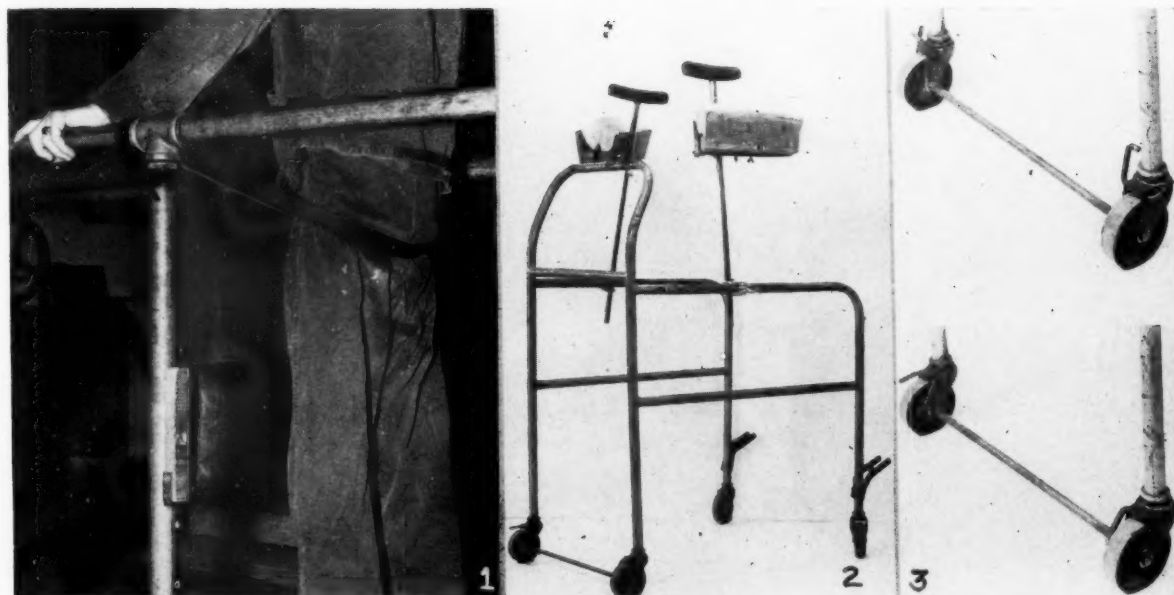


Fig. 1. Knee board with belt for hip stability.

This consists of a board 1" x 8" x width of the parallel bars, outside dimensions. The board is padded and upholstered except for 3" at either end where board fits brackets. A stop is provided on the bottom side of each end of the board to prevent it from moving. Two brackets made of $\frac{1}{4}$ x 1 x 15" flat bar is rolled to fit contour of the board. Each bracket is secured (allowing 5 or 6 inches for two bolt holes on bottom side of bracket) to middle uprights of the parallel bars by means of nuts and bolts or "tap in" screws. The height of the brackets are 17" from floor to walker. The board fits into brackets and extends across the walker providing a knee stop. Leather belts are used to stabilize the hips, if necessary. In cases of severe spasm, belts are sometimes used to hold feet in favorable position.

Fig. 2. The modified invalid crutch walker.

The handles are modified with padded forearm rests which are anchored to handle by means of nuts and bolts. Two holes are tapped in each side of frame to allow crutch attachments to be moved forward or backward for better comfort to the patient and to allow patient to rest the hands on the front portion of the frame. 2" ratchets constructed of $\frac{1}{4}$ " steel are riveted to the 3" casters and tapped in center to accommodate an axle which extends from one to the opposite front wheel. The ratchets are grooved for $\frac{1}{4}$ " bars which work freely from caster housing and become a drop lock into ratchet groove. This allows the patient to retain the forward advance he has gained. The axle keeps the front wheels fixed, guiding the walker in a straight line. The hinge-type locks on the rear wheels serve as an additional assist in guiding the walker in fixed direction and are used when necessary.

Fig. 3. Detail of ratchets shown in fig. 2.

This modification has been simplified by welding a flat bar from front caster housing to same on the opposite side. A flat bar is attached to each front upright (approximately 8" from floor to center of hole). Each bar has crutch tip on end providing a stop. The bars are allowed to move freely and, as the walker moves forward, the "stops" slide along. When walker stops, the tips are in position to hold. The operation is on the same principle as drop door stops.

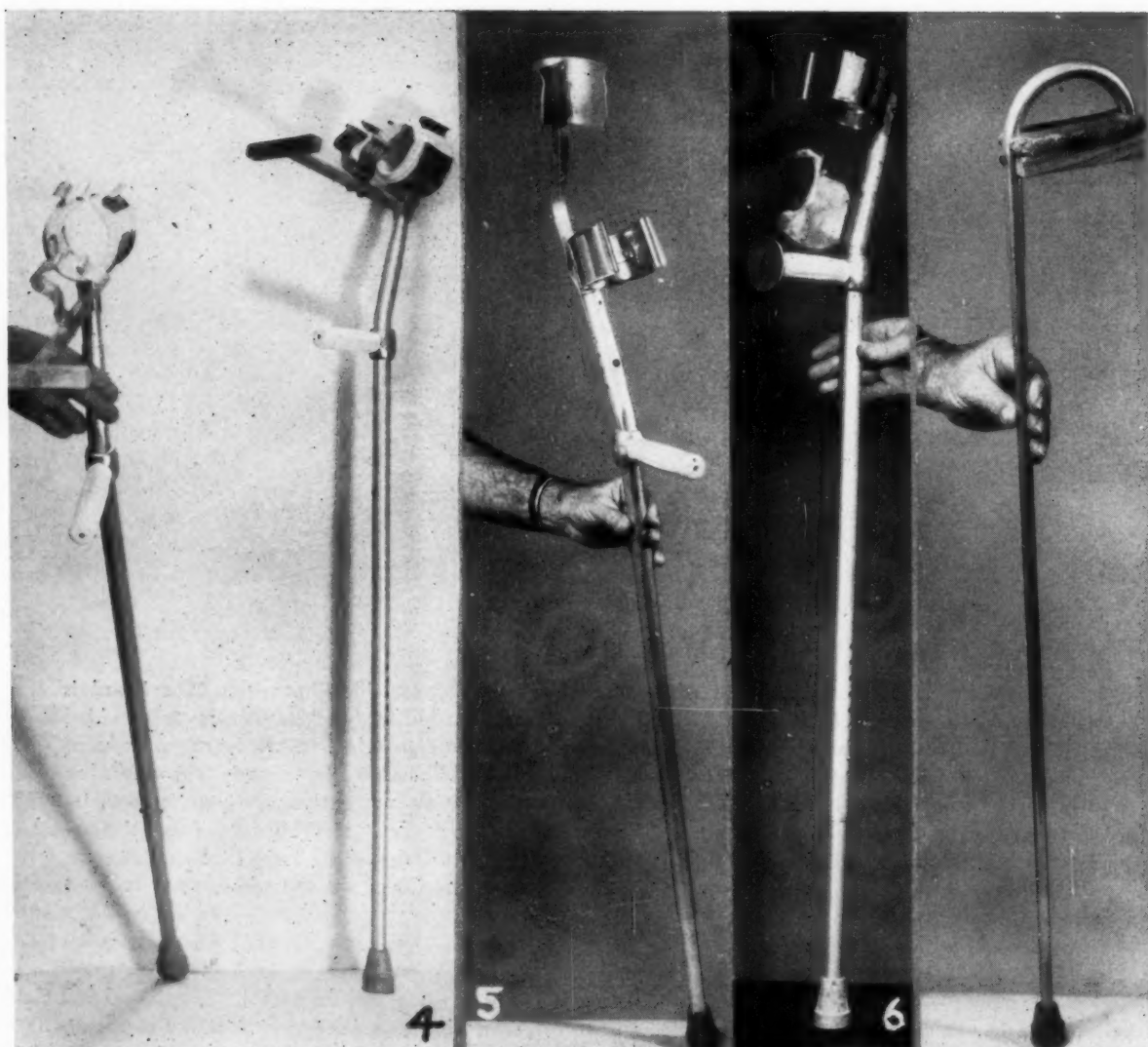


Fig. 4.

A "T" bar is forced into opening of the hinge at forearm band providing an extended forearm rest at 90°. Just above the wrist, a band, resembling the forearm band but smaller in diameter, is placed on the bar. This provides a mechanical advantage for control of the crutch. The cross bar at the end of the extension completes the "T" effect and is used primarily as a rest for the hand. The purpose of the modification is to provide a means of support for the patient with involvement of the upper and lower extremities and with deformities of the hands. The patient may have sufficient strength to walk but has poor balance.

Fig. 5.

A 1" x 15" aluminum flat bar (adjusted to length of arm) is attached by means of nuts and bolts to the tubing of the crutch at a site between the handle and the forearm band on the posterior aspect. Another band, similar to the forearm band, is attached to upper end of bar for triceps support. The patient with good hand and shoulder function locks the elbow in extension and is able to bear weight.

Fig. 6. For patients with weak wrist extensors and little or no grasp.

A metal disc of 3" diameter is attached to the end of the crutch handle by means of self-tapping screw. A wrist stop made of aluminum and rolled to fit the contour of the wrist is attached to the crutch by nuts and bolts (note padding). It is adjusted to gain desired position of wrists. A combined modification is shown here, but each modification has been used separately with success.

Fig. 7.

Modified long canes are used to allow the patient with poor balance, weakness of grasp and deformities of hands to ambulate. The canes are used primarily for balance. A piece of padded wood or metal is extended across the crook of the cane forming a closed end. The patient is allowed to bear enough weight for balance. The closed end allows him to move the cane without losing his grasp. Several of our patients have used this method of ambulation successfully.

the patient understand his limitations; however, the physiological and psychological benefits derived from the elevated activities are worth the effort. The morale of the patient is improved when he sees he can assume a standing position, no matter how much assistance is necessary.

In the following paragraphs, an attempt is made to cover the course of progress of a few patients with whom these and other adapted devices have been used:

Patient, A.T., a 42-year-old, colored male with a diagnosis of toxic neuropathy due to heavy metal toxicity (arsenic) with residual quadriplegia; chief involvement, partial paresis of all extremities plus flexion contractures and deformities of the fingers of both hands, was referred for elevated activities and was followed closely by the PMR Staff under the supervision and coordination of the Chief of Service. When stability and tolerance were sufficiently increased, the patient began ambulation in the modified crutch walker. He was placed in the walker by two therapists, using the forearm rests and bilateral knee cages for support. With manual assistance from one of the therapists, the patient was capable of moving the walker forward. The ratchets on the wheels prevented the walker from moving backward and the patient had sufficient hip flexors and stabilizers to step with one lower extremity and then the other. This procedure was repeated for approximately 15 feet on the first day before the patient tired. With an increase of this activity, the patient gradually improved his performance and demonstrated a marked increase in tolerance. His coordination improved to the extent that he was forcing the walker forward and stepping simultaneously. He continued to make steady progress over a period of many weeks and was cleared to increase activities. He was evaluated for crutches but could not handle them due to weakness of the elbow extensors and deformity and weakness of the hands. This problem was solved by providing the patient with the type of modified crutch, shown in Fig. 3. With this crutch, the patient became capable of moving from his wheelchair, unassisted, and of ambulating up to 100 yards before tiring. He could

move back into his chair unassisted. The patient continued to make progress and became capable of indefinite ambulation utilizing the modified long cane, as shown in Fig. 6. He also became capable of self-care except for the activities requiring the finer hand movements. After several reconstructive orthopedic operative procedures, the patient has gained some finger dexterity with the right hand. This increased his abilities in the activities of daily living and his vocational potential for post-discharge planning. The patient now weighs 143 pounds, as compared with 67 pounds when first seen, and is capable of indefinite ambulation using mild bracing.

Patient, T.S., was referred to the Physical Medicine and Rehabilitation Service for rehabilitation of severe residuals of polomyelitis one month following onset of disease. Shortly after his admission to this hospital, a muscle check revealed 50% or better function in most of the muscles of the left upper extremity but severe involvement of the right shoulder and both lower extremities, particularly the left leg. The patient received Hubbard tank, muscle re-education and specific activities, such as sling suspension, for support of the right upper extremity. The patient responded well to treatment and, when medically feasible, was referred for standing in the parallel bars. He was fitted with bilateral long-leg, lock-knee drop foot braces with a pelvic band attached. He demonstrated rapid progress and was allowed to attempt ambulation using the modified crutch walker and long-leg braces. This was accomplished as previously described and the patient was graduated from the modified crutch walker to a modified forearm crutch. When sufficient strength returned to the anti-gravity muscle groups, the patient was re-evaluated. The pelvic band was removed and the braces were modified. When the right quadriceps musculature was strong enough for weight bearing, the right brace was reduced to a short leg brace with drop-foot attachments. The patient's left upper extremity had improved sufficiently in strength to allow some weight bearing, but the right upper extremity still required the molded leather

brace (from wrist to mid-arm) because of the weakness of triceps; this in turn restricted the patient's activities and required someone to apply the brace and also made adjustment to crutches difficult for this particular patient. An extension was added to the forearm crutch for triceps support (See Fig. 4.) The patient became capable of extending the elbow and had sufficient strength in the hand and shoulder to use the extremity in weight bearing activities. With fair quadriceps on the right and sufficient support in the upper extremities, crutch walking was possible.

Using this crutch modification, the patient returned to his family and job months earlier than had been anticipated. Through the cooperation of the employer, vocational counseling service, and the medical staff, the patient's job was modified to meet his physical limitations.

Patient, L.T., a 25-year-old, white male sustained fracture of the lamina of C-6 and C-7 in an automobile accident on 12-10-51 with immediate paralysis and loss of sensation below C-6 spinal cord level. Patient was hospitalized for two months in a private hospital. A laminectomy was not done, but the patient was kept in Crutchfield tongs with 25 pounds of traction for the entire hospitalization. He was admitted to this hospital on 2-8-52, at which time he had good return of function of the upper and lower extremities considering the degree of involvement and the fact that he was only nine weeks post injury. The patient began bedside activities consisting of muscle re-education, coordinative active exercises to the lower extremities with manual resistance. This initial prescription included: evaluation of the muscle status for baseline, kinetic activities for utilization of small intrinsic muscles of the hands and flexion of the fingers, using braces to prevent over-function of the extensors. The patient gradually progressed sufficiently in strength to stand without assistance, but he was unable to balance well. Involuntary spasms in the lower extremities tended to make him lose his balance and fall. The under-arm crutches were contraindicated because the patient applied unusual pressure in the axilla and because of weakness of flexion of the hands and fingers; therefore, the forearm crutches were modified as shown in Fig. 5 and with practice the patient learned to use this type of crutch functionally. He became capable of indefinite ambulation and independent in self-care. This modification made

walking possible for the patient and he was returned to his home shortly thereafter.

Patient, M.M., was admitted to this hospital with fracture dislocation of C-4 and C-5 with some contusion of the cord at that level, resulting in incomplete quadriplegia. The patient had immediate decompressive laminectomy. Since that time, patient has progressed from the status of bed level and paralysis to becoming capable of self-care and indefinite ambulation utilizing modified forearm crutches. Following months of PMR treatment consisting of Hubbard tank, muscle re-education, standing bed activities, active assistive and passive range of motion, sling suspension to the lower extremities, and resistive exercises to the upper extremities, the patient progressed far enough to begin elevated activities in the parallel bars, utilizing the knee board as described under Fig. 1. The patient continued to make steady progress and was capable of taking a few labored steps in the modified crutch walker. He continued to improve but was unable to use the crutches because of weakness of flexors of the right hand. The forearm crutch was modified to meet this need. In addition to the simple metal disc as described under Fig. 6, a wrist stop was used to prevent over-stretching of the relaxed and weak right hand and finger flexors; thus, the wrist was stabilized in a protective position. The patient continued to make progress and is now capable of indefinite ambulation using this type of crutch. He is also capable of self-care and has reached maximum hospital benefits.

Summary

The modifications as described in the preceding paragraphs have been used successfully with other patients who demonstrated the same types of disabilities. In a period of three years, sixteen patients have utilized the adapted devices for elevated activities. Follow-up study has revealed that eight of these patients are back on the job; three of the total number remain in the hospital; three are at home; two are in training. Six of these patients are capable of independent ambulation; fifteen are capable of self-care activities within their physical limitations and adequate to their present needs; five of this total utilize the wheelchair to work from but do some walking. Five of these patients remain in the wheelchair all of the time during work training, but do stand and exercise at home for the physiological benefits as described previously in this paper.

Standing and walking activities can be accomplished
(Cont'd on Page 135)

A CHECKOUT PROCEDURE FOR ABOVE-KNEE ARTIFICIAL LIMBS*

MARSHALL A. GRAHAM, M.S.**

HERBERT E. KRAMER**

In the May, 1956, issue of the *Journal of the Association for Physical and Mental Rehabilitation*, the authors presented a procedure for evaluating the adequacy of below-knee prostheses. The problems of above-knee amputees are more acute than are those of below-knee cases, primarily as a result of the greater functional anatomical loss due to the higher amputation site.

A conventional above-knee prosthesis usually consists of a wooden foot with a toe-break (Fig. 1); an ankle with provision for dorsi and plantar flexion (although some also provide inversion and eversion); a wooden, metal, fiber or plastic shank; a single or multiple axis knee (providing flexion and extension) (Fig. 2); a carved wooden, metal, molded leather, or plastic socket; and a pelvic belt with a single or double axis hip joint (or an air valve, if a suction socket is used). Fig. 3 presents two conventional above-knee prostheses. One is fitted with a pelvic belt as the major means of suspension (No. 1), while the other utilizes the suction socket principle (No. 2). In addition, many above-knee amputees wear an extension aid in the form of a kick strap, hickory lever, wrap spring, coil spring, or compressible rubber bumpers to help in achieving knee extension while walking.

In past years there has been great emphasis placed on finding solutions to the problems of above-knee amputees. Because of this, an impressive array of literature is available concerning the fit, alignment, bio-mechanics, and training related to above-knee prostheses. However, to the writers' knowledge, there has been no comprehensive clinical procedure set forth by which the adequacy of an above-knee prosthesis could be determined. It is the purpose of this paper to present such a procedure.

As in the previous article dealing with below-knee prosthesis checkout, each italicized question re-

presents a point to be checked by the clinic group. A brief discussion follows the question with occasional hints for correction of a substandard condition. A work sheet for clinic use can easily be drawn from the information contained in this article, supplemented by the reader's experience. A suggested form for the work sheet has a short underlined space preceding each numbered question, so that a check (✓) or a "no" may be inserted as each item is covered at the clinic. The remedy for items that prove to have shortcomings may be obvious, in which case extensive discussion by the clinic group is unnecessary.

The check list which follows has been divided into four areas considered to be of major importance. The first area, quality control, is concerned with examination of the prosthesis before it is worn by the patient. The prosthesis is then examined as it is worn by the amputee while standing, sitting and walking. Any short-comings of the prosthesis should be corrected and the limb rechecked by the clinic prior to the start of training, since it is known that an inadequate limb can result in insurmountable training problems and can hinder the physical, emotional, and vocational adjustment of the amputee.

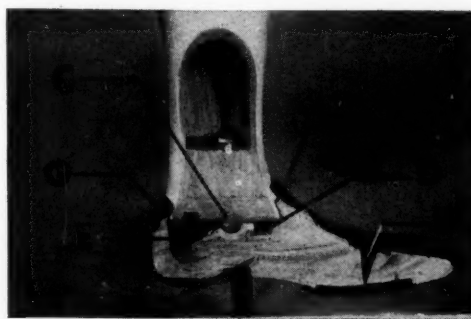


Figure 1

- A. Foot
- B. Toe-break
- C. Ankle joint and bushing
- D. Front ankle bumper (rubber or felt; acts as dorsi-flexion stop)
- E. Rear ankle bumper (rubber; for planter flexion)
- F. Anterior ankle articulation space (leather covered)
- G. Posterior ankle articulation space (leather covered)

*This is the second of two articles describing checkout procedures for lower extremity artificial limbs. The first article dealt exclusively with the below-knee prosthesis.

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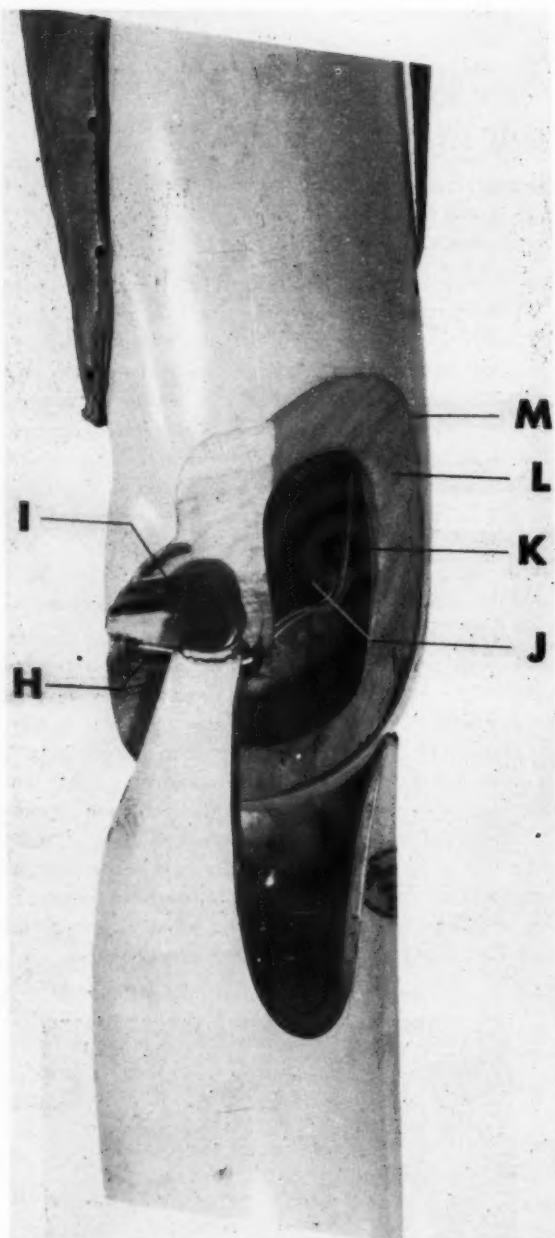


Figure II

- H. Knee friction adjustment screw
- I. Knee bolt (single axis)
- J. Knee control roller
- K. Knee control strap
- L. Willow or Bass wood construction
- M. Rawhide over wood (painted)

A. QUALITY CONTROL (to be checked with the prosthesis off the patient)

1. Is the color of the leg satisfactory and homogeneous?
2. Has the inside socket surface been completely

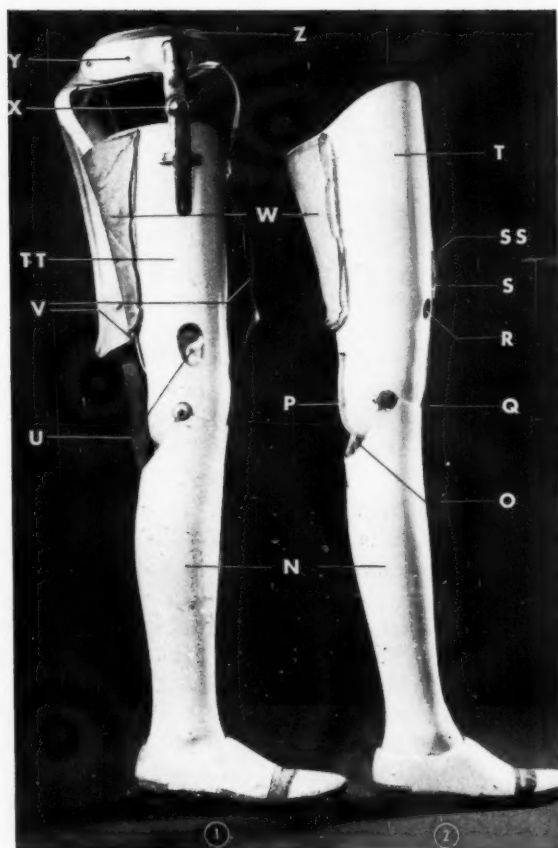


Figure III

- N. Shin
- O. Knee extension stop
- P. Cut out of knee (permits knee flexion)
- Q. Knee
- R. Suction socket valve opening
- S. Kick strap adjustment buckle
- SS. Kick strap
- T. Suction socket
- TT. Conventional, pelvic belt socket
- U. Air vent opening
- V. Knee control strap
- W. Back pad
- X. Pelvic joint
- Y. Pelvic band
- Z. Pelvic belt

and smoothly finished, i.e. a wood sealer covering the entire surface?

In a wood socket, a sealer will prevent perspiration from the stump from penetrating the wood, causing rough spots, raising of the grain, or cracking of the socket, any of which can be the cause of stump irritation. A good finish will permit adequate hygienic care, allowing residual perspiration from the socket surface to be easily removed.

3. Has the socket rim been adequately flared, and all sharp edges removed?

A sharp inside edge of the socket rim can cause discomfort and even laceration of the skin, especially in the case of obese amputees whose skin folds may overlap the socket rim.

4. *Is a back pad attached to the posterior socket wall?*

When the amputee seats himself on a hard surface, a back pad attached to the posterior socket wall will help to:

- a. Reduce the wear on trousers.
- b. Muffle the sound of the socket contacting the hard chair surface.

5. *If a pelvic joint is used, does the joint articulate smoothly without resistance or excessive lateral play?*

Excessive resistance will cause undue wear of the joint, shortening the maintenance-free period of use. It will also restrict hip motion, necessitating added effort by the amputee.

A loose joint can cause noise and loss of prosthetic control (by lateral movement of the socket) or, as a result of undue strain can fracture the hip joint.

6. *Is there proper clearance between the anterior portion of the knee and shin during knee flexion and extension?*

Too little clearance will cause rubbing of the surfaces between the knee and the anterior-proximal shin, producing noise. Too much clearance will allow the trouser material to catch, resulting in tearing and/or a restriction of knee flexion. Catching of the trouser is most likely to take place when rising from a sitting position or when walking into the wind.

7. *Is the knee extension stop padded?*

The knee extension stop should be padded with felt, rubber or other shock absorbent material. The padding will help to muffle noise caused by contact between the knee stop and the socket, as well as to reduce the impact at full extension during walking.

8. *Can the prosthetic knee be flexed a minimum of 120°?*

When sitting, adequate knee flexion will permit positioning of the prosthetic foot well under the chair.

This knee flexion range is also important to allow the amputee to kneel comfortably. Limited knee flexion will cause the amputee to fall forward and can cause stump discomfort.

A quick method for determining if the prosthetic knee allows sufficient flexion is to place the prosthesis in a kneeling position on a flat surface. With the knee flexed to its maximum,

the longitudinal axis of the socket should be posterior to a vertical line through the knee axis.

9. *Is the posterior-distal socket supported over the entire cut-out area of the shin during maximum knee flexion?*

This is particularly important when the amputee kneels. If the posterior-distal socket is not evenly supported over the entire shin cut-out area, there is a strong possibility that the posterior portion of the shin will splinter, crack or become deformed.

10. *Is there adequate clearance in the ankle articulation to prevent rubbing of parts or catching of socks?*

Too little clearance will cause rubbing of the inside surface of the foot on the ankle block, which may produce noise. Excessive clearance will allow the sock to catch, causing tearing and/or restriction of ankle movement.

11. *Has the artificial foot been properly upholstered and fitted to the shoe?*

Neat upholstery with no sharp protrusions or edges will do much to prevent tearing of socks.

If the foot is too small, slippage of the shoe can cause sock damage, or a tendency for the heel of the shoe to scuff the ground during the prosthetic swing phase. Naturally, if the foot is too large the amputee will find it difficult to change shoes or socks on his prosthesis.

12. *If a kick strap is used, is there adequate adjustment for increasing or decreasing tension?*

13. *In a suction socket, can the valve body be threaded easily in and out of the valve seat?*

It is important that the threads of the valve seat be free of glue or dirt, as improper seating of the valve body may cause loss of suction and/or "anti-social" noises.

B. STANDING (prosthesis on)

1. *Is the amputee secure while standing with good posture and with heels together?*

When the amputee stands with good posture and heels together, there should be no tendency for the prosthetic knee to buckle. Although the stump is extended to the rear, pressure should not be necessary to maintain knee stability. As a further check, have the amputee balance momentarily on the prosthesis, with the sound foot off the ground, to be sure the prosthetic knee does not buckle. (The fact that the amputee cannot balance himself on the prosthesis for any appreciable time does not indicate a pros-

thetic shortcoming, but may be due to inadequate training.)

Increased knee stability for the amputee can be accomplished most expeditiously either by (a) increasing knee extension by adjusting the knee extension stop or (b) setting the foot in additional plantar flexion.

These adjustments should be made conservatively or they may create such problems as:

- a. Hyper-extension of the prosthetic knee which can result in increased lumbar lordosis when the prosthesis is in stance phase. In addition, it will force the amputee to use greater stump effort to initiate knee flexion while walking, causing fatigue and/or poor appearance of gait (excessive rearward heel rise at toe-off).
- b. Excessive plantar flexion of the ankle which may cause the amputee to complain of a sensation of walking "up a hill" as he transfers his weight over the ball of the prosthetic foot, resulting in the feeling that the prosthesis is too long. In order to compensate for this apparent increase in length the amputee may develop such poor walking habits as rising excessively on the ball of the normal foot during the swing phase of the prosthesis (vaulting) or walk with an abducted or circumducted gait.

If the two prosthetic adjustments mentioned above are not successful, it may be necessary to sever the socket from the knee block and set it more anterior to the knee axis. It is routine prosthetic practice to fit amputees with medium or short stumps with the knee bolt posterior to a reference line between the greater trochanter of the femur and the ankle axis. In contrast, a well-trained amputee with a longer, well-developed stump can tolerate the knee axis closer to the trochanteric-ankle axis line, as an amputee of this type can more readily control prosthetic knee flexion.

2. *Is the amputee comfortable while standing on the prosthesis with good posture and heels close together?*

The above-knee amputee bears weight primarily at the:

- a. Ischial tuberosity
- b. Gluteus maximus region

Weight-bearing is avoided as much as possible in the adductor, femoral triangle and ramus regions of the stump. Some weight is borne over a major portion of the remaining area of

the stump, extending to approximately 1½ inches of the end. The distal stump should be relatively free of weight, since it is generally more sensitive in this area.

3. *Is the artificial leg the correct length?*

The adequacy of the length of the prosthesis can be determined by visual examination of the anterior-superior iliac spines. The usual procedure is for the examiner to place his thumbs on these spinous processes and by sight judge whether or not they are level.

If the height appears unsatisfactory, the use of prepared flat wooden slabs of varying thicknesses ($\frac{1}{8}$ ", $\frac{1}{4}$ " and $\frac{1}{2}$ ") is very helpful in determining the amount of alteration necessary to correct the length of the prosthesis.

4. *Is the anterior-medial area of the socket wall properly contoured to avoid excessive pressure in the femoral triangle region?*

Too tight a fit in the femoral triangle (Scarpa's triangle) region will usually cause an "aching sensation." Too low a fit in the femoral triangle will cause the development of a flesh roll which may present serious fitting problems.

The need for a properly contoured socket in this area is critical, since edema of the stump is often associated with restriction of the lymphatic and venous return, due to localized restriction in the femoral triangle as well as the distal regions of the stump.

5. *Is the medial socket wall the correct height to prevent (a) formation of an adductor flesh roll and (b) excessive pressure on the ramus of the pubis?*

A low medial wall may not initially cause the amputee any appreciable discomfort. However, with time, an adductor roll will develop which will not only hinder the amputee's gait (as he will tend to walk with the prosthesis in abduction to avoid friction and pressure) but will also cause fitting difficulties. It is felt that the medial wall should be no more than $\frac{1}{4}$ inch lower than the level of the ischial seat of the socket.

Ideally, the ramus should be located inside the medial socket wall which should be so shaped as to minimize pressure during weight-bearing.

6. *Is the ischial tuberosity properly situated on the ischial support of the socket?*

Present knowledge of above-knee prostheses indicates a quadrilaterally shaped socket with a definite flat portion on the posterior-medial rim, which becomes the major weight-bearing area of the socket (for placement of the ischial

tuberosity of the pelvis). If the ischium should slip off this socket support area, the amputee will experience acute discomfort. Improper placement of the ischial tuberosity on the socket rim (tuberosity inside the socket) is an indication that the distance between the anterior and posterior socket walls is too great, providing insufficient counterpressure along the anterior socket wall for stabilizing the ischial tuberosity on its seat. This distance between the anterior and posterior socket walls represents a critical measurement of the amputee's stump (the distance between the adductor longus tendon and the ischial tuberosity). Present expert opinion is that the ischial tuberosity should be located one-half inch posterior to the inner surface of the rear wall and one inch from the inner medial socket wall. Therefore, the anterior-posterior dimensions of the inner socket walls should be one-half inch less than the adductor longus-ischial tuberosity measurement.

To determine whether the ischial tuberosity is properly positioned on the socket, have the amputee remove his weight from the prosthesis, place a finger (with the palm up) on the ischial tuberosity and allow the amputee to re-apply his weight to the socket. In cases where location of the ischial tuberosity is difficult (muscular and/or obese patients), it may be necessary to have the patient bend forward in order to properly locate the bony prominence and then have him straighten up as he re-applies weight to the prosthesis.

It is further suggested that the clinician mark the location of the ischial support on the socket before removing his finger. This mark will allow location of the ischial support with the prosthesis off the patient.

7. *Is the distal stump free of tension?*

To check the tension of the skin at the end of the stump, insert a finger through the valve opening of the suction socket or through the air vent opening of a conventional socket and palpate the stump while the amputee alternates his weight on and off the prosthesis. This procedure will also tell the relative position of the stump within the socket and give information about the pumping action taking place between the stump and socket.

Excessive tension on the distal stump will cause an uncomfortable pulling sensation that is often exaggerated when scar tissue is in this area.

8. *Is there adequate socket space distal to the*

stump while the amputee puts full weight on the prosthesis?

There should be approximately 2 inches of socket space distal to the stump to reduce the possibility of the end of the stump hitting the bottom of the socket during full weight-bearing or if the stump should slip too far into the socket.

Limited clearance in the suction socket will mean too small an air space which may cause too great a fluctuation of positive and negative pressures during use. The recommended suction socket pressure in the past has been one to two pounds per square inch for both negative and positive pressures. However, this should not be a hard and fast rule. There have been reports of successful suction socket wearers with socket pressures as high as four to five pounds per square inch.

9. *On weight-bearing does the stump stay in contact with the lateral socket wall?*

On weight-bearing the lateral stump should be in firm contact with the socket wall in order to afford maximum lateral support for the amputee. This can be determined best by asking the amputee if the lateral wall gives support without pain or discomfort.

In the suction type socket, the lateral fit becomes more critical. There should be no gap between the lateral rim of the socket and the amputee's stump, as this will cause breakage of the suction seal allowing air to enter or escape from the socket with accompanying "anti-social noise."

10. *If a pelvic belt is used, does it accurately fit the contours of the body?*

The pelvic belt should pass between the iliac crest and the greater trochanter and not exert excessive pressure on the anterior-superior iliac spine. A well fitting pelvic band and joint will do much to overcome excessive pumping action between the stump and socket while walking. Excessive pumping action can cause skin irritations of the stump and may force the amputee to walk with a gait characterized by vaulting, abduction or circumduction.

11. *If a pelvic belt with hip joint is used, is the head of the joint located on or anterior to the greater trochanter?*

The pelvic joint should be attached to the socket on or slightly anterior to the greater trochanter and parallel to the line of progression for best function while walking and comfort while sitting. Pinching of the flesh in this area

is not uncommon with an improperly located pelvic joint. (Also, see SITTING, questions 1 and 5).

12. *If a Silesian belt is used, are the attachments properly located?*

The lateral attachment of the Silesian bandage should be at a point about $\frac{1}{4}$ inch posterior to the greater trochanter.

The anterior attachment should be at or near a point formed by the intersection of:

- a. a horizontal line at the level of the ischial seat
- b. a vertical line down the middle of the socket

C. SITTING

1. *Can the amputee sit comfortably with his hip flexed to 90 degrees?*

Particular attention should be directed to the anterior socket rim while the amputee is seated with the hip and knee flexed to 90 degrees. With the suction socket, too high an anterior wall may push against the bony prominence of the pelvis, displacing the socket. There is usually no discomfort with too low an anterior wall of a suction socket, although this is conducive to the development of an anterior flesh roll.

With the pelvic belt leg, too high an anterior wall can cause pressure and pain where it strikes the pelvis and can restrict hip flexion. Too low an anterior rim may cause crowding and pinching of the flesh of the anterior proximal stump.

An additional check of the correct height of the anterior socket wall is to have the amputee bend forward and touch his feet while sitting.

2. *Is the prosthetic knee the correct height and length in proportion to the sound knee?*

The prosthetic knee presents an objectionable appearance if it extends beyond or is higher than the sound knee while the amputee is sitting. Either of these conditions indicates that the prosthetic knee axis does not coincide with the center of rotation of the sound knee.

If the prosthetic knee extends too far (knee center too low and socket too long) the prosthetic foot may not reach the floor. If the prosthetic knee is too high (knee center too high) the amputee may have difficulty when sitting at a desk or table or when driving a car.

An amputee with a long-above-knee stump supra-condylar or Gritti-Stokes amputation) may require a prosthesis with a knee center that is lower than the sound knee in order to allow for fitting with a conventional above-knee

prosthesis. This is especially true of a suction socket, due to the need for an air space.

3. *Does the knee remain flexed while the amputee is seated?*

If an extension aid has too much tension, it will tend to extend the prosthetic knee when the foot is lifted from the floor. This condition is more prevalent with amputees who do not utilize knee friction.

4. *Can the amputee sit without the prosthesis internally or externally rotating?*

The outer posterior socket wall should be relatively flat, so that the prosthetic shin remains vertical when in contact with a hard surface.

Another cause of medial or lateral rotation of the prosthesis while sitting is improper placement of the pelvic joint. If the joint head is placed too far anteriorly (and medially rotated to the line of progression) the thigh portion of the prosthesis will rotate internally and the shin will adduct. If the joint head is placed too far posteriorly, the thigh portion of the prosthesis will rotate externally and the shin will adduct. As previously mentioned, the recommended placement of the pelvic joint is on or slightly anterior to the greater trochanter.

5. *Does the prosthesis remain in good abduction-adduction alignment?*

While sitting, the amputee should be able to comfortably maintain the thigh portion of the prosthesis parallel to the thigh of his non-amputated limb.

Although adduction is not usually encountered, abduction of the thigh is quite common. The amputee may abduct the prosthesis to relieve pressure in the adductor or femoral triangle regions of the stump.

A second cause may be that the pelvic joint assembly does not closely follow the anatomical contours of the hip and thigh while sitting. There should not be a large gap between the joint and the body, and the joint assembly should not be in abduction in relation to the body parts. Pressure or gapping of the pelvic band can also cause abduction.

6. *Does the lateral socket wall remain in contact with the stump?*

Gapping at the lateral wall of the socket while the amputee sits is an indication that the socket fit or alignment is improper. The socket should fit snugly around the entire stump periphery. Gapping is usually associated with pressures at the lateral-distal and/or the medial-proximal stump and can often be attributed to

poor shaping of the socket. In addition, there is a problem of air loss for the suction socket wearer.

7. *Is the ischial support area of the socket properly contoured to prevent stump discomfort?*

A sharp burning sensation in the ischial tuberosity area is an indication of insufficient relief for the hamstring muscle tendons as they are stretched over the ischial support region of the socket. The burning sensation is the result of pressure on the stretched tendons as well as friction. The usual procedure is to relieve the ischial support region within the socket by sloping the socket in this area or by channeling the socket to allow sufficient room for the tendons of the hamstring muscles. This burning sensation is usually noticed after several moments of sitting.

8. *With the suction socket, can the amputee re-apply his weight after sitting without any disturbing "suction noises"?*

Ask the amputee to stand, putting his weight on the prosthesis. A flatulating noise occurring when weight is re-applied, is an indication that air has re-entered the socket (commonly at the lateral socket wall). A condition of this type can be very embarrassing to the wearer and if not corrected, may result in the rejection of the suction socket. A high, well-contoured socket fit across the lateral wall will prevent this type of noise.

D. WALKING

1. *Is the amputee comfortable while walking? If not, specify areas of discomfort.*

Areas of discomfort of the stump, which may not be a problem while sitting or even standing, become acute while walking, due to the constantly changing distribution of weight in the socket.

Special attention should be directed to the following regions in which discomfort and irritation are commonly found:

- Ischial tuberosity
- Ramus of the pubis
- Proximal adductor region
- Femoral triangle (Scarpa's triangle)
- Distal lateral region

Every effort should be made to provide the amputee with a comfortable socket, since his adaptability to training and his subsequent performance depends heavily upon being comfortable.

2. *Is the amputee secure while walking?*

Prosthetic instability of the above-knee am-

putee consists basically of two types: (a) buckling at the knee and (b) lateral instability.

- (a) *Buckling at the knee* is the most dangerous of these two balance problems since inadvertent flexion of the prosthetic knee, occurring when the prosthesis is weight-bearing (stance phase) can cause falling. Three common causes of an insecure prosthetic knee are:

- Faulty anterior-posterior alignment of the knee. The center of rotation of the knee is too far anterior to a reference line between the greater trochanter and the prosthetic ankle axis (see question 1, STANDING).
- Too hard a rear ankle bumper (plantar flexion bumper). Too hard a rear ankle bumper resists plantar flexion at the time of heel contact causing the forward momentum of the body to be applied to the knee resulting in a tendency to buckle. This can be overcome to some extent by excessive rearward stump pressure.
- Excessive dorsi-flexion of the prosthetic ankle. General prosthetic practice has aligned the foot on the shin at an angle of 90° or slightly greater (plantar flexion). Excessive dorsi-flexion will place the knee axis too far anterior to the greater trochanter-ankle axis line, so that when the amputee transfers his weight to the prosthesis, the knee will tend to buckle.

If the prosthetic knee is unstable, the amputee may incorporate various compensatory movements in his gait pattern to overcome the difficulties he may be experiencing. The four most common observable compensatory movements are:

- forcefully flexing the prosthetic knee and then abruptly extending it with a whip-like motion
- overextending the prosthesis, deliberately taking a long prosthetic step and then exaggerating the hard impact at heel contact
- walking with a slow, halting gait and with "double knee action"; the prosthetic knee does not maintain full extension as the weight is transferred to the prosthesis after heel contact and the amputee re-extends the knee by forcing the socket backwards with his stump
- lordosis—the amputee uses extensor muscles of the back as a substitute

for weak hip extensors to help maintain knee extension

(b) *Lateral instability*—The amputee should feel that the prosthesis remains directly under him during stance phase with little or no tendency to shift his body weight laterally. Lateral instability is usually associated with a shifting of the entire prosthesis laterally as full weight is taken on the artificial limb. The two basic causes of this incorrect instability are medial-lateral alignment of the prosthesis and inadequate training.

Improper alignment may be corrected by increasing the width of the walking base. The suggested way of doing this is to displace the knee-shin-foot of the prosthesis laterally in relation to the socket. This procedure widens the base of support without influencing the position of the stump within the socket.

A second cause of lateral instability is inadequate training. An amputee should be trained in balancing, so that he is able to utilize the hip abductors on the amputated side for maintaining a stable position.

As in knee stability, the amputee may compensate in his gait pattern for the feeling of lateral insecurity by walking with an abducted gait or with considerable lateral bending of the trunk over the prosthesis.

3. *Does the amputee walk with a reasonably narrow base of support?*

In evaluating this factor, each amputee must be considered as an individual. The length of his stump and his general body type must be taken into consideration. It is to be expected, for instance, that an obese, endomorphic type of individual will naturally walk with greater abduction than would a thin or muscular person.

In addition, in order to increase lateral stability, it has been the practice to fit very short-above-knee stumps with a prosthesis set in exaggerated valgus (the prosthetic foot outset), which produces a wider base of support.

Occasionally with a pelvic belt wearer, abduction can be caused by the joint being in abduction.

Another cause of abducted gait is pain or pressure in the abductor or ramus region of the socket. The amputee abducts his stump and therefore, the prosthesis, in order to gain relief in these areas. In such cases, abduction is often accompanied by lateral bending of the trunk.

However, there is no reason why the average

above-knee amputee, with no physical or prosthetic complications, cannot walk with his base of support as narrow as that of a non-amputee. This is usually between $\frac{1}{2}$ and 2 inches distance between the inner borders of the shoes.

4. *Does the prosthesis swing in a straight line of progression?*

The three major variations of the swing phase of a prosthesis in the sagittal plane are:

- a. a medial whip
- b. a lateral whip
- c. circumduction

A medial whip is characterized by a movement of the heel of the prosthetic foot medially and a rotation of the knee laterally, noticed immediately after toe-off. The foot then rotates back to its usual position either drawing the remainder of the swing phase (causing a "fish tail" effect), or returns to its original position by the toe rotating medially immediately after the heel of the prosthesis contacts the ground. A medial whip is corrected by the prosthetist rotating the prosthetic knee medially. In addition to alignment factors, a medial whip may be caused by too tight a socket fit in the area of the *adductor longus* muscle and tendon.

A lateral whip is the direct reverse of a medial whip, with the heel of the foot moving laterally and the knee rotating medially immediately after toe-off of the prosthesis. A lateral whip is corrected by the prosthetist rotating the prosthetic knee laterally. A whip of this type may be caused by too tight a socket fit in the area of the *gluteus maximus*.

Circumduction is a movement of the prosthesis in a lateral arc during its swing phase. It can be caused by too long a prosthesis, or by the amputee walking with little or no knee flexion and so moving his prosthesis outward in order to assure the foot clearing the ground.

5. *Is the resistance of the rear ankle bumper adequate to prevent foot-slap?*

Too little resistance of the prosthetic ankle to plantar flexion is caused by too soft a rear ankle bumper. The plantar surface of the prosthetic foot therefore strikes the floor too rapidly and with an audible "slap", as the body weight is applied to the prosthesis after heel contact.

6. *Is the resistance of the rear ankle bumper low enough to prevent external rotation of the foot?*

Too much resistance of the prosthetic ankle to plantar flexion is caused by too hard a rear ankle bumper. The plantar surface of the prosthetic foot is therefore retarded from striking

the floor after heel contact, allowing the natural rotation of the leg and body to externally rotate the prosthetic foot before it is flat on the floor. The delay of the sole of the foot in contacting the floor is readily observable as the amputee walks.

7. *Is the toe-out of the prosthetic foot reasonably close to that of the normal foot?*
8. *Is the friction at the knee adequate to control the forward and rearward prosthetic swings?*

The correct setting of a knee friction mechanism will do much to eliminate the two major swing phase gait deviations caused by prosthetic inadequacy, i.e., excessive rearward prosthetic heel rise and violent impact at full knee extension.

At the time of toe-off, the amputee flexes his hip, moving his stump and socket forward. Without friction, the shin of the prosthesis has a tendency to remain at rest or to move in a direction opposite that of the stump (Newton's Laws of Motion) depending on the force and speed of hip flexion. The result is excessive rearward heel rise of the prosthetic foot after toe-off.

This excessive heel rise causes, in turn, a time lag in the extension of the prosthetic knee. The amputee finds it necessary to wait for the knee to become extended, and so, for the prosthesis to become weight-bearing. This waiting may cause poor gait characteristics such as *vaulting* (rising on the toe of the normal foot while the prosthesis is in the swing phase) or erratic acceleration (a surging of the entire body with each non-prosthetic step).

Adding friction to the knee creates a more direct relationship between the prosthetic thigh and shin (consider the extreme situation of enough friction to lock the knee in extension) and so the rearward motion of the shin and foot is minimized. Correct adjustment will produce equal heel rise for both the prosthetic and natural legs. (in the natural leg, rearward heel rise is controlled by action of the quadriceps femoris muscles.)

After knee flexion is completed, a prosthesis with no friction at the knee exhibits the characteristics of a pendulum. The shin and foot start the forward swing and gradually increase their speed by means of gravity, but strike the knee extension stop before they are allowed to decelerate naturally (by means of gravity).

In the human body, a gradual deceleration of the shin is accomplished by the hamstring

muscles of the thigh. Friction applied to the prosthetic knee acts for the same purpose as the hamstrings although not in the same manner. The friction found in most conventional prosthesis is of a constant type (i.e., acts throughout the swing phase range of the knee), whereas the human muscles act with progressively greater strength, creating what has become known as *terminal deceleration*.*

Also, because of the excessive rearward heel rise and impact at full knee extension caused by lack of friction especially during fast walking, the amputee is forced to restrict his walking speed. The addition of friction at the knee makes it easier for the amputee to walk faster with better prosthetic control and better appearance.

Friction should be adjusted for the amputee's normal walking speed. However, it should not be so great as to require an undue amount of stump effort to fully extend the prosthetic knee. High friction may also tend to cause the foot to "hang up" at the end of the rearward motion. It is the opinion of the authors that with present commercially available prosthetic devices, knee control can be achieved with a fairly high degree of friction and the addition of a knee extension aid (see question 9 below).

9. *If a knee extension mechanism is used, is it properly adjusted?*

The primary functions of an extension aid are: a) to minimize excessive rearward heel rise, and b) to assist gravity in initiating the knee extension movement. As the knee flexes, the extension aid (be it in the form of a kick-strap, hickory lever, wrap spring, coil spring, or compressible bumper) is placed progressively on increasing tension until the tension overrides the force of inertia that is causing the prosthetic heel rise rearward.

Then, due to its tensed condition, the extension aid acts to help gravity initiate and carry the knee extension movement (forward swing phase).

However, the extension mechanism should not be so tight that it limits knee flexion and causes scuffing of the prosthetic toe. Too tight an adjustment will also tend to bring the shin into full extension with too much force, result-

(Cont'd on Page 135)

*Several prostheses still in experimental stages provide a variable type of friction that more closely approximates muscle functions.

A PULLEY TRACTION EXERCISE GLOVE*

F. W. S. MODERN, M.D.

RUDOLPH JAHN, B.S., C.C.T.

GEORGE V. DEVINS, B.A., C.C.T.

JOHN C. RUSSEY, CERT. PROST. ORTHOT.

One of the principles in the retraining of patients with neuromuscular disorders is that normal motion patterns should be aimed for during the training period. It is our opinion that devices which interfere with the development of normal motion patterns have a questionable value since they are defeating their purpose and, to an extent, retard retraining.

Spasm is frequently a prominent element in many of the neuro-muscular disorders which physical medicine clinics are called upon to treat. One of the conventional appliances which is used in these conditions—particularly in hemiplegics—is the overhead pulley device in which the patient pulls the paralyzed arm into extension with his normal arm and when the normal arm relaxes, the paralyzed arm flexes. This is accomplished by the normal hand grasping the iron bar of a stirrup-shaped attachment which by rope and two pulleys is connected to another stirrup to which the paralyzed hand is secured with bandages in a flexed grasping position.

This appliance is the one used conventionally in relieving the contractures due to spasm of the involved muscles. It is obvious that this design follows a poor functional pattern as it fixes the flexion due to spasticity of the hands and fingers—frequently the most involved members—while elbow and shoulder are extended.

The problem is to construct a device which permits extension and flexion in all points simultaneously according to the appropriate motions. Essentially it means the construction of an apparatus which secures the hand to the pulley and yet allows complete freedom of motion in all fingers and hand joints and the wrist.

To accomplish this, we constructed a glove with individual finger straps that are primarily fingerlings for ease in placement on the hand. Each strap is attached to the base of an aluminum triangle, the tip of which in turn is fastened to a rope by a ring and a leather loop. The rope fastened to the ring extends upward to the ceiling, passing through two pulleys set a little over shoulder width apart. The end of the

rope is then attached to a stirrup-shaped handle. The rope length is such that the affected arm is completely extended overhead when the unaffected arm is



Fig. 1

Affected arm, wrist and fingers in complete extension as a result of using the "Pulley Traction Exercise Glove."

*From Physical Medicine and Rehabilitation Service and the Brace Shop, Veterans Administration Hospital, Long Beach, Calif.



Fig. 2

Arm in relaxed position with wrist, hand and fingers in flexed position.

extended downward. The glove is anchored to the wrist by a leather cuff that is shaped to fit the contour of the wrist thus reducing the possibility of injury by the edge of the glove.

The traction glove is used extensively for many types of upper extremity conditions in addition to those resulting from cerebro-vascular accidents; for example those resulting from arthritis, poliomyelitis, fractures, multiple sclerosis, and many others. The traction glove has been used in these conditions to elevate the extremity and extend the wrist, fingers,

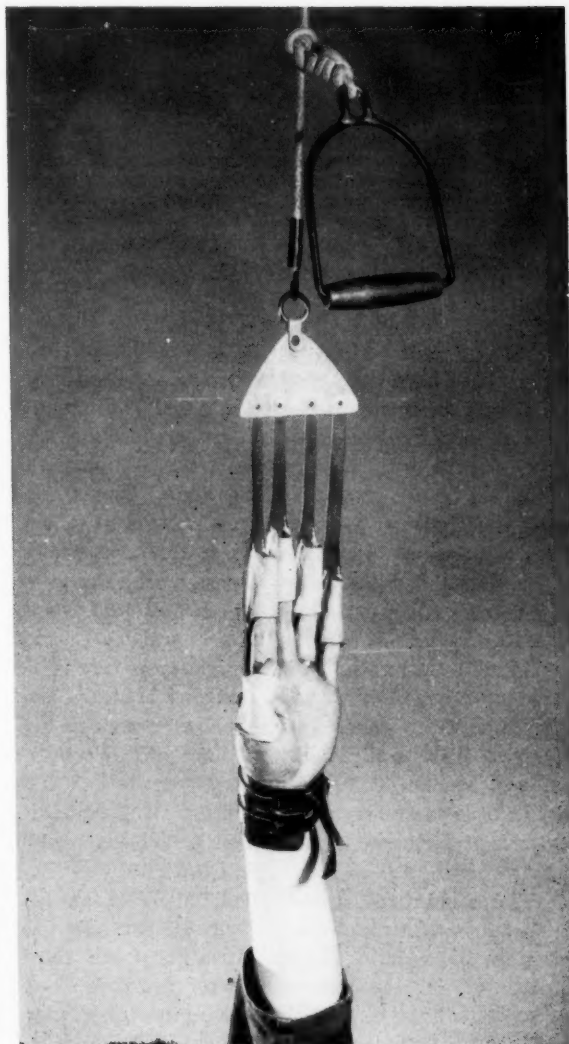


Fig. 3

Close-up of arm under traction showing wrist strap, fingerlings, straps, aluminum triangle, ring and rope.

elbow and shoulder to gain a near-normal position during a regular exercise regime. This, coupled with the use of shoulder wheel, wall weights, dumbbells, quadripedal, manual stretching, free exercise and muscle reeducation, makes a well rounded program directed toward stretching the flexors of the fingers, wrist, elbow and the depressors of the shoulders. It allows strengthening of the antagonistic muscle groups.

The rapidity of relaxation of the flexure spasm of fingers and wrists is often astounding. The hands of patients which had not relaxed for years in some cases opened up after as few as six to fifteen pulls

Continued on Page 139

COMMITTEE REPORTS

Lack of space prevents complete publication of the reports of committee chairmen as presented at the annual meeting in Augusta. However, the reports have been abstracted and the bulk of the committee's recommendations appear below:

Standing Committees

AWARDS—George V. Devins, Chairman

Several systems for selecting nominations for awards have been tried and found lacking. This year, the committee members were sent a list of all candidates for each award and were asked to place the candidates in the order of their preference. A numerical tabulation of the votes thus was obtained which enabled the chairman to announce the winners of the three association awards: the John E. Davis Award to Dr. Louis B. Newman of Chicago, Ill.; the Achievement Award in Rehabilitation to Melvin J. Maas, Maj. Gen., USMCR Ret., of Washington, D. C. and the Annual Corrective Therapy Award to Frank S. Deyoe of Saxonville, Mass. Nominees for Life, Honorary and Fellow memberships were presented to the Board of Governors who chose the following by a 2/3 vote in compliance with the regulations of the constitution: Honorary Membership to Dr. Ferdinand Schwartz of Birmingham, Ala., and Fellowship Membership to the 1955-56 Executive Board.

The committee recommended: (1) that awards voted but not received at the annual banquet be presented by a local chapter at appropriate ceremonies; (2) that recommendations for awards be limited to 200 words; (3) that Jan. 1 be designated the deadline for submitting nominees for awards; (4) that Life Memberships include a paid-up membership for life with a certificate and a card of a permanent nature being awarded; that a Fellow Membership and an Honorary Membership include the awarding of an appropriate certificate and a card of permanent nature; (5) that an Honor Roll be published to include all persons who have received honorable mention in connection with the various awards.

CHAPTERS — Sam Boruchov, Chairman

Five sector representatives were appointed to act as intermediaries between the president of the association and the chapters; to disseminate information to the chapters; to encourage the formation of new chapters and to collect the annual renewal fee from each of the existing groups. The representatives accomplished an outstanding job in keeping the chapters informed and in organizing them to be eligible for

charters. Renewal fees were collected from each of the chapters holding charters in the organization. A new chapter in New Jersey is expected to be organized in the near future.

The Chapters Committee recommended the following: (1) to pass legislation which would bar chapters without charters; (2) to continue the objectives passed by the Representative Assembly in 1955; (3) to promote a better exchange of information by the chapters through the exchange of representatives at clinical sessions, newsletters, and the like; (4) to place monies collected by the Chapter Chairman in a separate fund to be used by the Chapter Committee.

CONFERENCE — Phil Davis, Chairman

The chairman included a copy of the revised tentative program of the convention with his report. A total of eleven exhibitors had contracted for convention booths at the time of the report. Response from scientific exhibitors was good and the final exhibit should be adequate for a meeting the size of this association's.

In soliciting for exhibitors personal contact was the only successful method although a total of 450 invitations to exhibit were mailed out by Mr. Beck. The cost of printing the convention program was met through advertisements in the program itself and through the booster drive. The latter was aided considerably by the generous contribution of many of the staff of the Chillicothe (Ohio) VAH.

The selection of Augusta as our convention site was made two years ago. Since that time the progressive deterioration of the situation in regard to integration has made for a situation which created a host of unexpected problems for the convention chairman. A major decision was in reference to the cancellation of the annual banquet in favor of an "Honor Awards Night." The chairman recommended that future conventions of our association be held in areas other than the South until such time as the present situation is alleviated.

CONSTITUTION—Lester W. Burrowes, Chairman

Four proposal amendments have been drafted and approved by the committee for consideration at the 1956 convention. The proposals are relative to the election of the Director of Publications-Elect and his duties; to the election, duties, term of office and qualifications for members of the Representative Assembly; to the qualifications for active membership and certification; and to the delegation of powers

by the Board of Governors, Executive Board and Representative Assembly. A proposal amendment which would provide succession to the office of President was drafted but tabled. A proposal amendment which would set up an emergency expense account for the president was drafted and forwarded to the standing committee coordinator.

The committee submitted the following recommendations for study and consideration: (1) to draft an amendment relative to the yearly chapter fee; (2) to correct Article X, Sec. 1 of the By-Laws to include the word, "area"; (3) to draft a proposal amendment relative to Article VI, Sect. 1 changing this section to read, "Nominating Committee composed of chairman and four members who shall be members of the Representative Assembly, with the four members being appointed from other areas other than that of the chairman;" (4) To clarify a conflict between Article I, sections 4 and 6.

A number of suggestions relative to constitutional amendments were received from chairmen of various committees. They were instructed to draft their respective proposals and to submit them to the Constitution Chairman for approval by the committee.

MEMBERSHIP—*Charles Willhite, Chairman*

Over the past two years there has been a drop of approximately 6½% in active membership and 30% in associate and professional membership. Despite the fact that recruitment added about 10% to our total membership this year delinquencies of membership renewals more than offset these gains.

With the association now operating on a fiscal year basis, all monies will now be collected by the treasurer which should help to eliminate much confusion connected with the dues collection problem.

The following recommendations were offered: (1) institute a permanent file for membership; (2) for the treasurer to compile lists of persons paying dues and certification fees and to forward these lists regularly to the committee chairmen concerned; (3) for a reasonable transition period to be established during which time the newly elected officers and the outgoing officers would work together in order that the business of the association might proceed in orderly fashion; (4) to standardize membership in terms of the various awards which are annually presented; (5) to devise a method whereby delinquent members or persons who have not renewed their certification would be prohibited from wearing the insignia bearing the term, "certified corrective therapist."

NOMINATION — *Alfred Ellison, Chairman*

The committee conducted a poll of membership to serve as a guide in selecting candidates for nomination

to the Executive Board. Approximately 17% of the membership replied to the poll, a result which was too indefinite to serve its purposes. It was the opinion of the committee that the poll should be discontinued in the future and that the wording of the By-Laws, Article IX, Section 4a be changed to read, "Request names of qualified candidates for office from chapters and members" rather than to infer that a poll of each member is mandatory in this case. The following slate of nominees was presented by the Committee: First Vice-President, Lester Burrowes (Miss.); Raymond Heaslet (Ala.); Eleanor Stone (N. Y.); Charles Willhite (Calif.); and William Cully (Pa.); Second Vice-President, Charles Bader (Me.); Karl Klein (Texas); David Ser (N.Y.); Arthur Tauber (N.Y.); and Hyman Wettstein (N.Y.). Third Vice-President, George Nash (Wisc.); Paul Roland (Ohio); Michael Yarosh (Pa.); and Chris Kopf (N.J.). Secretary, David Bilowit (N. J.) and Stanley Wertz (Tenn.). Treasurer, Mario Andriolo (N.Y.); Joseph Evans (Ky.); Van Goodsell (N.J.) and Sidney Mackler (Mass.).

PROFESSIONAL STANDARDS—*Chris Kopf, Chairman.*

The committee forwarded membership requirements to individuals interested in the association, forwarded scholarship requirements for certification, and reviewed the eligibility of candidates for active membership during the past year.

The committee recommended that certain criteria for evaluation be established which would enable individuals of exceptional skill or ability to be granted a waiver of some of the educational requirements necessary for active membership status. Among the criteria, the following credentials should be considered: long and meritorious service in the field (five years or more); outstanding contribution to the field through research or publication of articles; high recommendations from doctors and supervisors; education obtained through studies abroad in which equivalent degrees may have been granted.

RECRUITMENT—*Walter D. Matheny, Chairman.*

Meetings of the committee were held at Columbia University and the Walter D. Matheny School during April and May of this year. The committee consisted of Dr. Cecil W. Morgan, Dr. Josephine L. Rathbone, Dr. Raymond A. Weiss and Mr. Chris Kopf in addition to the chairman.

The committee recommended that any recruiting for the field of corrective therapy should be done on a broad basis and that all recruiting should be for basic training rather than for any specific job classification or for a specific school. The opinion of

the committee was that the association should work out its recruitment problems with the AAHPER, the Council on Hospital Recreation and the NRA. It was suggested that a council made up from representatives of these three groups would serve advantageously to help solve the problem on a mutual basis.

The committee recommended that the association scholarship fund be designated to help accomplish recruitment and that a brochure or job analysis folder be prepared by representatives from the organizations above to bring the specialized physical education fields to the attention of undergraduates in colleges and universities. Should the mutual brochure idea prove unfeasible, the committee recommended that the APMR undertake this with the endorsement of the other groups.

The committee recommended that qualified APMR members be induced to visit various schools of physical education within their areas to orient undergraduates in regard to job opportunities within the field. Expenses of such visits would be met from the funds available for recruitment purposes.

Administrative Committees

ADVERTISING—*David S. Bilowit, Chairman*

The present advertising chairman held the post from July, 1954 until the present time. A comparison of income from advertising between the journal issue of July, 1954 and that of June, 1956 shows approximately a 56% increase in revenue. The chairman recommended a continuation of a policy to utilize a professional approach in soliciting advertisements and to think in terms of long term objectives.

BROCHURE—*Kenneth Dening, Chairman*

A temporary brochure was multilithed to serve as a source of general information about the association to persons unfamiliar with the organization. After receiving comments from association members and the Advisory Board, it is planned to incorporate suggestions into a more permanent form.

A rough draft for a second brochure describing the profession of Corrective Therapy has been worked up and mailed to interested persons for comments. A number of photographs are being examined for possible reproduction in the final brochure on C. T.

The chairman recommended that funds for brochures be budgeted and that the chairman be either empowered to make decisions relative to the final format for brochures from his samplings of opinion from the field or that the chairman have an advisory board to select the final content and format for the brochures.

CERTIFICATION—*Thomas J. Fleming, Chairman*

The official registry was published in *The Journal* (Vol. 10, No. 1., Jan. 1956) and each certified member received a personal copy of the registry. The registry was distributed to each member of the certification board and to selected doctors and hospitals at the request of various members.

There was a loss of approximately 10% of certified members during the year. In some cases this was due to delinquency in paying the renewal fee; in other cases, it was due to delinquency in paying association dues.

During the year, Dr. Arthur Steindler of Mercy Hospital, Iowa City, Iowa and Dr. Raymond A. Weiss, Professor of Education at New York University were added to the Board.

The annual meeting of the Board was held at the Roosevelt Hotel in New York on Nov. 30, 1955. At this time the Board gave its approval to the creation of a Board of Examiners and approved suggestions of the type of examination to be given for certification in corrective therapy. Dr. Weiss was appointed to develop the examination and Louis F. Mantovano was approved as coordinator of the examining section. A list of authorized examiners was approved to assist in administering the examination.

Written, performance, and interview examinations were prepared by Dr. Weiss and a manual of instructions was completed for the use of persons assisting in the administration of the tests.

An investigation of the credentials of all candidates for the certification was conducted by the coordinator of the examining section and all candidates were notified as to their status. A resolution relative to the granting of the right of certain individuals who lack only a minimum of the qualifications to take the examination and to thereby qualify for provisional certification is being submitted for the approval of the Board of Governors.

The certification committee recommended that certification renewal fees be paid directly to the Treasurer; that registries be mailed out by the Secretary of the APMR rather than the Secretary of the Certification Board; that a survey be made among doctors, educators and therapists for appropriate questions and answers of sample questions to be used in forthcoming examinations; and that Dr. Weiss be appointed as examination consultant to both the association and the certification board.

EMBLEMS—*Frank J. Dignan, Chairman*

A total of 131 standard emblems and 713 certified emblems are still on hand after sales within the year which amounted to \$28.00.

To Be Continued Next Issue

Can He Walk?

(Continued from Page 120)

plished for the quadriplegic patient, with incomplete paralysis, within limits of disability. Utilization of modified and/or adapted devices have been found to be beneficial in mobilization and motivation of the quadriplegic patient with incomplete paralysis and tend to decrease the length of hospitalization. Continued use of the adapted devices in post-hospital status makes possible selected vocational placement and the practice of activities of daily living with the devices results in further strengthening of functional neuromuscular components. Thus these patients are exemplifying the treatise, "living with your limitations."

Rehabilitation

(Continued from Page 113)

gradually eliminated by the advancing march of medical science only to be replaced by a myriad of functional illnesses for which there is no specific remedy.

"Since the corrective therapist is concerned with the total individual and the personality as well as the body, he is in a unique position to render a distinctive service in this extending and widening area of functional illness," Dr. Davis said. "The corrective therapist engaged in the treatment of both organic and functional illness will become increasingly concerned with the latter as a real challenge to his intuitive and scientific understanding."

A Checkout Procedure

(Continued from Page 129)

ing in a jarring impact on the stump. As previously mentioned, there must be a proper balance of forces between the extension aid and the knee friction.

10. *At the conclusion of this phase of the checkout, have the amputee remove his prosthesis and examine the stump for any irritated or discolored areas, which might indicate need for further prosthetic service.*

In the preceding pages the authors have attempted to present in concise form the highlights of a checkout procedure for above-knee artificial limbs. This checkout is applicable to both suction socket and pelvic belt types of prostheses by simply omitting the few questions that do not apply in either case.

The authors wish to thank members of the Prosthetic Devices Study Staff for their review of this article.

"From Other Journals"

PETER T. MACKLEN, "Medical Misconceptions and Quackery," *McGill Medical Journal*, 24:181-188, December, 1955.

Medical misconceptions arose from three main sources: old medical theories and therapies, religion and philosophy, and witchcraft and magic. They are maintained by tradition, ignorance, authority and quackery. It is much easier to believe a lie than to question it.

PJR

W. E. TUCKER, "Sprains of the Limb Joints," *British Medical Journal*, 4965:515-516, March 3, 1956.

For the purpose of treating athletic injuries, sprains are divided into mild, moderate and severe. In mild sprains a few fibers only of a ligament or one of its strands are torn. Modified weight bearing can be allowed at once, provided the ligament is supported by a felt pad placed over the tender point and a firm crepe bandage. Bandaging is preferable to taping as the patient can remove it to carry out home treatment in the form of baths, massage and non-strain exercise. Injections, electrical current and manipulation may be used. A mild sprain treated this way is often symptom-free within two or three days and the joint can be subjected to strenuous activity.

Moderate sprains occur when the ligament is partially torn and the full body weight has been thrust on the joint, stimulating the synovial membrane or causing a synovial tear. There is marked synovial effusion and considerable pain. All cases should be X-rayed. A bandage must be applied, reinforced if necessary by strapping. Any large synovial effusion should be aspirated. Weight bearing should be allowed only when all synovial effusion has subsided—usually within four to five days. Thereafter, graduated activities continue until recovery, which is usually within two to three weeks.

Severe strains are those with a ruptured ligament and an unstable joint. They occur only in the case of rapid movement. After open operation these cases are placed in a well-padded cast for ten days and the limb kept elevated. Isometric exercises are given to move muscle groups and faradism to stimulate individual muscles. At the end of 10 days the cast is split and the joint treated as in the moderate degree. No weight bearing is allowed for three weeks. Severe sprains recover in 6 to 8 weeks, provided there are no complications.

PJR

JOSEPH BERKELEY, "Double Spring Exercises," *Archives of Physical Medicine and Rehabilitation*, 37:156-158, March, 1956.

In the double extension spring method the patient sits comfortably on a bench. A leather anklet with ring attachments in front and back is strapped on the ankle and extension springs are attached to the rings. The other ends of the springs are attached to the wall in front and on the floor behind the patient. The patient is told to flex the knee and extend it repeatedly to the full limits of his range of movement. The usual exercise period is 15 minutes, during which the patient does 500 to 1,000 repetitions. High repetition, low-resistance exercises are used to increase the range of movement. The method is useful for patients with poor muscular coordination and limitations in knee joint movement; it is contraindicated in conditions in which knee movements are painful. Preliminary results for painless stiff elbow and frozen shoulder have been encouraging.

PJR

ANCEL KEYS, JOSEPH T. ANDERSON and OLAF MIKELSEN, "Serum Cholesterol in Men in Basal and Non-basal States," *Science*, 123-29, 6 January 1956.

Cholesterol was measured in serum from 100 male students in the basal fasting state and again 2 hours after breakfast. When men were relatively inactive after break-

fast there was a highly significant rise in serum total cholesterol. When breakfast was followed by moderately vigorous physical work, the mean value tended to fall from the basal level. The difference between the exercise and nonexercise response was highly significant. The cause of the rise after breakfast when sedentary conditions were maintained cannot be ascribed to cholesterol in the meal; it must reflect a rise in lipoproteins, meeting the demand for transport of the newly absorbed fat. During physical activity the enhanced rate of circulation, plus nutrient withdrawals from the blood, results in a lowered serum concentration of lipoproteins and hence of cholesterol. This suggests a reason for part of the difference in susceptibility to coronary heart disease that is reported in comparisons between active and inactive men. PJR

THEODORT L. DORPAT and THOMAS H. HOLMES, "Mechanisms of Skeletal Muscle Pain and Fatigue," *Archives of Neurology and Psychiatry*, 74:628-640, December, 1955.

Lewis postulated that pain in ischemic, active muscles was brought about by the accumulation in the tissue spaces of a metabolite designated Factor P. Sustained muscle tension can evoke pain. In the light of evidence that tetanic contractions cause a reduction in muscle blood flow, it seemed desirable to explore the hypothesis that the pain mechanisms involved were essentially those of ischemic pain. Strong rhythmic and sustained skeletal muscle contractions produced characteristic ischemic pain. This was most marked in strong contractions. In strong contractions there was a decrease in muscle temperature of about 0.1 degree C, which extended for approximately 30 seconds. This indicated a decrease in the blood flow. Experiments with water baths at 45°C. and at 20°C. suggested that reducing the blood flow promoted the appearance of pain in the muscle, whereas increased blood flow delayed pain. Venous stasis produced by an occluding cuff promoted the appearance of pain. The recovery rates of skeletal muscle from periods of pain and fatigue are similar and roughly proportional to the magnitude of blood flow. The retention of fluid and electrolytes within the active muscles during and after prolonged intermittent contractions may explain in part the swelling observed. The spacing and duration of muscle relaxation pauses during contractions are important factors in muscle economy. Contraction obstructs the blood vessels mechanically and renders the muscle relatively ischemic during the contraction. The increase in blood flow which accompanies muscle activity takes place predominantly during periods of relaxation between contractions. Agents suggested to be Factor P include anoxia, acid metabolites, products of tissue injury, phosphoric acid, histamine and potassium. The available evidence indicates that potassium is the pain factor, or one of its important components. PJR

OTTO WARBURG, "On the Origin of Cancer Cells," *Science*, 123:309-314, 24 February 1956.

Irreversible damage to the respiration of body cells is the cause of cancer. The resulting energy deficiency forces the cells to make use of the fermentation of normal body cells to compensate for the respiratory failure. Once normal respiration has been lost it cannot be regained. This may require several decades. The latency period of the production of cancer is the time in which the fermentation increases after the damaging of the respiration. Clinical production of cancer results from intermittent irritations which led to intermittent circulatory disturbances. Fermentation of the body cells has nothing to do with normal growth but is an inheritance of undifferentiated ancestors that have lived in the past at the expense of fermentation energy. The energy supplying reaction of fermentation is morphologically inferior to respiration. Not even yeast can maintain its structure permanently by fermentation alone; it degenerates to bizarre forms. It is no wonder that body cells become undifferentiated and grow wildly upon continuous replacement of their respiration with fermentation. X-rays cause a further decrease in the respiration of cancer cells; if it falls below a certain minimum the cell dies. However, the survivors of normal cells may compensate for their decreased respiration by fermentation increase and

thence become cancer cells. There is no alternative to this explanation of the origin of cancer cells. The continual discovery of miscellaneous cancer causes only obscure the underlying phenomena. PJR

GEORGE H. HESS and DAVID A. FULTZ, "Damaging Effects of Strenuous Exercise", *United States Armed Forces Medical Journal* 7:3:369-378, March 1956.

A two weeks physical testing program of (1) pull up, (2) squat jump, (3) push up, (4) sit-up, and (5) 60-second squat thrust was given daily to a group of men on active duty. Thirty six men of this group were over 30 years of age and seventy-one were under 30 years of age. Before and after the testing program each man was given a vital capacity test and the Harvard Step Test. During each session of exercises the subjects' pulse and blood pressure were recorded before exercise; immediately after; 5 minutes after; and 15 minutes after.

Results: Three men could not complete the study because of physical abnormalities. In the post study examinations the following were found: (1) Traces of albumin were found in four subjects; (2) Electrocardiographic changes were found in about 20% of the subjects but remained within normal limits; (3) No roentgenographic changes were noted; (4) no significant changes in vital capacity occurred. All subjects showed regular improvement in the ability to perform exercises. Greater improvement occurred with respect to exercises requiring more coordination. Average time for pulse rate to return to normal was for the above 30 years group, 29 minutes, and for the under 30 years group, 23 minutes. About 10% of the men experienced tachycardia which lasted 1½ to 2 hours after exercise. Scores of the Harvard Step Test were practically the same after the two weeks as they were before the two weeks exercise. J. T.

MARY LOUISE JOHNSON, BERTHA S. BURKE and J. MAYER, "Relative Importance of Inactivity and Overeating in The Energy Balance of Obese High School Girls," *American Journal of Clinical Nutrition*, 4:37-44, January-February, 1956.

The fact that a substantial, and perhaps increasing, proportion of U. S. children are obese has focused attention on the possible causes of this condition. Attempts at explanation have been based on the concept that fat must reflect an abnormally large caloric intake. Reduced caloric output has not been considered because it is fallaciously assumed that exercise consumes relatively little energy and increases the appetite. Studies of two matched groups of high school girls showed that the caloric intake of the obese children was not higher and in most cases was less than their non-obese controls. Both the obese girls and their controls were strikingly inactive physically, but the non-obese girls averaged twice as much time in competitive sports. In this sample of obese girls, inactivity was of much greater importance than excessive food intake in the development of obesity. PJR

JAMES W. RAE, JR. and LEONARD F. BENDER, "Treatment of Patients with Rheumatoid Arthritis by Physical Means," *Journal of the American Medical Association*, 160: 611-613, February 25, 1956.

Physical treatment remains the most neglected agent of proved value in the management of rheumatoid arthritis. Heat may serve as an analgesic or antispasmodic. It increases the rate of circulation and of metabolism. Massage can increase the venous blood flow or lymph flow. It is used mostly for its sedative and relaxing effects and frequently should precede exercise. Exercise is usually designed to maintain or increase strength, endurance and coordination of muscles. Exercise to maintain or increase the range of motion in involved joints and increase the strength in the weakened muscles is most important; special attention should be paid to the hands and wrist to prevent deformity. Periods of hospitalization are usually short and should stress more and better instruction in home programs of physical management. Techniques of heat, massage and exercise should be explained to the patient and to those who will be helping him at home. Written instructions should be provided. Frequent rechecks on an outpatient basis are desirable. PJR

Editorials

A BRIGHTENING OF THE HORIZON

Not since the days of that lusty protagonist of the vigorous life, the late Teddy Roosevelt, had Washington officialdom evinced an interest in the physical fitness of its citizens in peacetime. At Annapolis, Md. in late June this situation was reversed as 140 conferees from the fields of health, medicine, physical education and public education met under the official designation of the President's Conference on the Fitness of American Youth with Vice President Nixon serving as chairman.

Plans for this conference were made some time ago after President Eisenhower had expressed grave concern over the results of the now famous Kraus-Weber tests (*The Research Quarterly* 25:2:178-188) May, 1954) which undertook to prove a physical superiority for European children over the children of this country.

Despite the heated controversy which has prevailed in physical education circles since the results of the tests were first published, it was decided to hold a meeting in which experts in this area could sit down together to decide whether or not fitness did constitute a national problem, and if it did, to decide what could be done about it. After listening to a series of lectures and discussions the conferees (although divided on the question of what the essentials of physical fitness actually are) decided that American children, sated with television, automobiles and all the creature comforts of our modern culture, were indeed in danger of becoming underdeveloped weaklings. What could be done about the situation? In a report prepared by Dr. Samuel M. Brownell, U.S. Commissioner of Education; Dr. W. W. Bauer of the AMA; Mrs. Rollin Brown, president of the national PTA; and Kenneth L. Wilson, president of the U.S. Olympic Committee, the conference went on record as favoring such measures as: raising the standards and prestige of the physical education profession; popularizing and promoting national fitness programs for children; making the public fitness-conscious; developing research in fitness; increasing community recreational facilities; allotting more time, equipment, and personnel for the physical education program; and emphasizing a program for the non-athletic child rather than the star

player. In addition to these recommendations, the conference called on the President to appoint two national groups on fitness, one from within the government and one from civilian life. The President has already agreed to do this and has created a Council on Youth Fitness at the cabinet level as well as a Citizens Advisory Committee on the Fitness of American Youth which will be composed of persons prominent in fields related to physical fitness.

To many of us who have watched the physical education pendulum swing from a program primarily aimed at the development of strong bodies to one which attempted to incorporate modern educational theory into practice on the playing field and gymnasium floor, there has always existed a thought that the pendulum had perhaps swung too far; that many of the attributes of the older program had somehow been lost as the liberals in physical education came to dominate its philosophy. It is our opinion that this conference may well mark a turning-point in which some of the features of the older type program will be restored, and that such matters as strength, endurance, and bodily vigor will again have meaning for Americans.

Another indication of government interest in physical fitness is embodied in HR 11521 introduced into the House in June by Rep. James C. Murray (Dem., Ill.) and now in committee. This resolution calls for definite research in physical fitness by studying "the immediate and long-range effects of various forms of physical exertion on individuals at various ages, the medical, physical, physiological, social and educational aspects of all sports at various age levels and the required time that should be allotted from an elementary or high school student's school day to a supervised physical education program." It is our conviction that this bill is greatly needed and we urge all members of our organization to support it by writing their congressman asking him to vote for this measure when it comes up for vote.

As specialists in the field of reconditioning as well as physical education, corrective therapists should be greatly encouraged by the interest the government is now showing in physical fitness. It seems to us that here is a situation in which we can make a real contribution.

Book Reviews

"Kinesiology Manual," by Leon G. Kranz. (St. Louis: The C. V. Mosby Company. Third Edition, 1956. 224 pp. Paper. \$3.75)

Kranz's *Kinesiology Manual* has been a standard text in its field for several years. In this Third Edition he has expanded his topic by including a paragraph on exercise with the description of each muscle. Rather surprisingly, most of the arm exercises involve the use of wall weights. This apparatus is seldom found except in high school gymnasias and meets with marked disinterest on the part of the students. It would have been more in keeping with the spirit of the times and more useful to students if the movements had been described in terms of progressive resistance exercises. Kranz continues to insist that there are no second class levers in the body. While this is still a matter of dispute, Gerstein has recently given strong support to Kranz's analysis of the kinesiology of heel raises. It is the reviewer's opinion that the argument must be settled in Kranz's favor. This manual should be in every corrective therapy department to be available as a quick and convenient refresher.

PJR

"Weight Training for Athletics," by Oscar State. (London: Amateur Athletic Association, n. d. 90 pp. 84c)

The word "Athletics" in the title of this booklet actually refers to track and field. Apparently this is a common British usage, since the same is true of Webster's *The Science of Athletics*. The thesis of this publication is that "whatever his event, an athlete needs to be strong to perform the technique with the maximum efficiency," but weight training is quite sanely presented as only one of the many factors that go into a complete training program. After a general introduction to the subject of progressive resistance exercise, the author takes up each event individually and outlines a training program for it. The descriptions are clear and are supplemented by a lavish use of photographs. This little book is cheerfully recommended to anyone interested in its subject. At the price, it is a real bargain.

PJR

"Mind and Body" by Pedro L. Entralgo. (New York: Kenedy & Sons. 150 pp. \$3.50.)

This small book is the author's attempt to trace the development of medical thinking and practice from ancient times until the present day. It is the author's promise that the "personalism" of Assyro-Babylonian medicine and the "naturalism" of Greek medicine are joined by the psychoanalytic concepts of Freud into a medicine of the "total person." This new medicine according to Entralgo is the beginning of "anthropological" medicine. If the translation of this book from the Spanish is accurate, the author's philosophic concepts and pseudo-scientific terminology result in conclusions of which psychiatry and psychology have been aware for many years.

In this reviewer's opinion, this book is merely a "re-hash" of philosophic religious concepts loosely integrated by psychoanalytic concepts into a medicine which the modern progressive physician recognizes today under the term "comprehensive" medicine. Although the book is overloaded with quotations from other sources (predominantly Spanish) there is neither subject or author index nor is the date of publication shown on the fly leaf.

This book may be of interest to the theologian but for the physician, psychiatrist and psychologist it contains no material which has not been stated more accurately and clearly in other volumes on medical history.

DCL

"The Golf Secret," by H. A. Murray (New York: Emerson Books, Inc., 1954. 160 pp. \$2.50)

"More Golf Secrets," by H. A. Murray. (New York: Emerson Books, Inc., 1955. 160 pp. \$2.50)

In these books Dr. Murray has applied his knowledge of anatomy in an attempt to produce a "real, universal, acceptable golf theory." His arguments are developed in detail, which makes these books academic in nature. Any book on sports which attempts to present the *why* of skill techniques, as these do, at once become heavy reading for a beginner and disturbing for the expert. The beginning golfer has enough trouble trying to put together the elements of the swing without the additional burden of thinking about the several reasons for doing the movements a certain way. In *The Golf Secret* and *More Golf Secrets*, the beginner meets the further difficulty of reading Dr. Murray's scholarly explanations of the *wrong* ways to use a golf club. The golf expert, as Dr. Murray astutely points out, often has no concept of *what* he is doing. When pressed for an explanation regarding details of his swing he often gives wrong answers. He is not trying to hide any secrets—he really does not know. And, this is, undoubtedly, to his benefit. Skilled movements, such as the golf swing, are performed wholly. They are made up of too many parts for man's brain to think about all at once. Ideally, he makes use of his lower centers of nervous control and employs his reflex mechanisms. At this lower level of control the golfer merely concentrates upon his objective in terms of distance and direction and depends upon established patterns of movement to accomplish all of the details. The highly skilled golfer performing a well executed shot is unconscious of his movements, and he should be. However, there is a real place for Dr. Murray's books in both the beginning and the expert golfer's search for an improved game. They are used ideally between seasons of golf. Off-season is really the only time a golfer can think of the fine details of his swing without having it hurt his game. Whenever he attempts to analyze his swing during play, his game will suffer. Of course, he may wish to make a temporary sacrifice in hopes of bettering his next rounds. There is some evidence that one can actually improve his game during off seasons by continually thinking over the movements involved. Alex Morrison has used this approach in his *Better Golf Without Practice*. It is known that neuromuscular activity may reinforce nerve network patterns of coordination. This may explain why golfers play an unusually good game the first time out at the beginning of the season.

LEM

"Six Approaches to Psychotherapy," Edited by James A. McCorty. (New York: Dryden Press. 402 pp. \$3.75. 1955)

This book presents an overview of the recognized approaches to psychotherapy by eminent authorities in the various schools. Non-directive, directive and psychoanalytic principles underlying these approaches are clearly outlined and techniques briefly discussed. Hypnotherapy, Group Psychotherapy and Psychodrama are considered in separate sections and the principles and objectives of these methods are clearly set forth. The final section of this volume summarizes the similarities and differences in the therapeutic schools and recognizes the need for additional study of the therapist's personality and techniques. Included among the authors are Hobbs, Slavson, Wolberg, Reider, Thorne, Moreno and Sheer.

This is one of the better symposia on psychotherapy. Brief and uncluttered by excess verbiage, the various chapters are written with clarity of thought and enthusiasm. The chapter summarizing the material is stimulating and objective, and projects the need for research directed toward an integration of the sound principles present in each of the approaches considered. The book will be of value to the therapist, psychologist, social worker, educator and interested layman who recognizes the dangers inherent in a rigidly restricted single psychotherapeutic approach and who can adopt the major premise that recovery is the ultimate goal of all therapy.

The Index and references are unusually complete.

DCL

"Schools of Psychoanalytic Thought," by Ruth L. Munroe. (New York: The Dryden Press, 1955. 670 pp. \$7.50.)

Probably every therapist with N.P. experience has at one time or another been confused by the fact that psychiatrists representing different schools of thought gave different interpretations in the same case. What, he has wondered, is the reason for this and what implications does it have for his own personal relationship with the patient? In this excellent and long-needed book, Munroe, a psychologist not directly affiliated with any of the psychoanalytic schools, has given us many of the answers. She has divided the analysts into three main groups: the Freudians, who emphasize instinctual drives; the non-Freudians, who emphasize the "self"; and those who do not fit into either of these classifications. There is, she tells us, a great deal of overlapping in this grouping; differences between them are principally the result of their varying emphasis upon the kind of dynamics considered fundamental in the personality of the patient. The orientation of the book is primarily clinical. The theories of the two major groups are discussed in terms of the organism, the milieu, the genetic process, the dynamics of the personality, and pathology and treatment. She finds that in actuality there is but little difference in their therapeutic methods in spite of the differences in underlying theory. The third group are given less space, since their influence on therapy is very limited. This may, perhaps, not be entirely fair to Rank's role in the development of non-directive counseling. The presentation of the subject is highlighted at frequent intervals by "critical comment," in which the author reveals her own reaction to the analyst studied and tries to view his contributions to the field in an objective manner. The text does not have to be read straight through. If the reader prefers, he can take it up section by section, as his interests dictate. This is a long book. It is clearly written, but the material discussed requires close attention. There are difficult semantic problems for the non-professional reader in that the same term is used differently by different schools and the amount of professional jargon that has grown up in this field is enormous. This is a book to be studied, not casually read. Therapists who are willing to give it the necessary time and attention will find that it is an important contribution to the literature. Chiefs of P.M.R.S. in neuropsychiatric hospitals might do well to seriously consider setting up study groups of their therapists using this book as the text. **PJR**

"The Fields of Group Psychotherapy," Edited by S. R. Slavson. (New York: International University Press, Inc., 1956. 338 pp. \$6.00.)

As a continuum of his studies in and development of sound group psychotherapeutic principles, Slavson in this volume applies his knowledge of group-dynamics to fields outside of the clinical sciences. His ability to select recognized professional authorities as co-authors and his compilation and integration of the mass of material available into a readable whole provides the reader with additional insight into the expanding science of group psychotherapy and the multiple applications of such techniques.

Mental hospitals, psychosomatic disorders, addiction, education for sex and marital problems and community mental health are seen as areas where group psychotherapy may provide a partial resolution for problems of disturbed personal and group inter-relationships. Stimulating in its approach, the material outlined in this book provides possible answers to the ever-present question of treatment of the emotionally disturbed. **DCL**

"Shock and Circulatory Homeostasis," edited by Harold D. Green. (New York: Josiah Macy, Jr., Foundation, 1955. 291 pp. \$5.00)

This symposium consisted of seven separate but closely related sections: Action of Epinephrine in Man, The Circulation in the Periphery, Mesenteric Lymphatic Dynamics in the Rat, The Circulation in the Splanchnic Area, The Pulmonary Circulation, The Pulmonary Circulation in Hemorrhagic Shock and The Aortic and Coronary Blood Flow. The blood flow through muscles has always been a

topic of particular interest to students of the physiology of exercise. They will be especially interested in the material on methodology of circulation measurements to be found in the first section. The second section continued the study of this problem by emphasizing the techniques and difficulties involved in measuring oxygen tension through the skin by electrical means. In the fourth meeting it was contended that the ordinary textbooks of physiology have not kept up with the literature available on the problem of blood flow in the liver. In the fifth section Cournard raised the interesting point that immediately after the start of exercise there is a pressure rise in the pulmonary artery. This soon returns to normal, but the rise serves to open up some closed vessels which may accommodate a large flow increase during exercise. At the next session it was pointed out that the opposite may occur during hemorrhagic shock—vasoconstriction develops and closure of parts of the pulmonary vascular system may follow. In the last meeting Gregg reported studies of cardiac response to stress made upon natives of the Peruvian Andes. He interpreted his findings to indicate that although their hearts were well adapted to the altitude, they responded to work with greater effort than did the hearts of dwellers at sea level. An interesting discussion of the effects of exercise on circulation followed. Each section contains a good bibliography and the book is well indexed. It would be helpful in these symposia if the editor would contribute a final chapter summarizing the material and bringing it together. **PJR**

"Lives in Progress," by Robert W. White. (New York: 1955; 378 pp. Dryden Press.)

Lives in Progress presents a longitudinal study of the personalities of three "normal" subjects. Biological, psychodynamic and social effects are investigated by multiple methods including psychometric studies over a period of approximately ten years. The results provide the author an opportunity to theorize, explain and evaluate where possible, on the biological roots of personality, psychodynamics of development and shaping of lives by social forces. The material is well integrated, personality studies are unusually thorough and the author writes with clarity in an interesting style. The clear exposition in this book of the "forces shaping personality" provides basic material for advanced study. Reference material and indexes are unusually complete.

This book should find a place in the library of scientist, psychologist, physician and intelligent lay person. **DCL**

Books Received

"Preinduction Health and Human Relations" edited by Esther Emerson Sweeney and Roy E. Dickerson. (New York: American Social Hygiene Association, Boyd Printing Co., 1953. 173 pp. \$1.50)

"Letters to my Daughter" by Dagobert D. Runes. (New York: Philosophical Library, Inc., 1954. 131 pp. \$2.50)

"Psychology in the Nursery School" translated by Charles L. Hannam. (New York: Philosophical Library, Inc., 1953. 140 pp. \$3.75)

"The Scourge of the Swastika" by Lord Russell of Liverpool. (New York: Philosophical Library, Inc., 1954. 259 pp. \$4.50)

Pulley Traction

(Continued from Page 131)

by the normal extremity. We did, however, encounter cases in which no relaxation occurred after weeks of effort.

Summary:

A glove type piece of equipment is described that stimulates the normal motion pattern position of all joints of the upper extremity, including the hand, when raised overhead by a rope and pulley. The unaffected hand provides the motor power.

CHIEF CT POST TO VAN SCHOICK

Joseph H. Van Schoick, special assistant to the Veterans Administration director of physical medicine and rehabilitation in Washington, D. C., has been appointed chief of corrective therapy at Washington. Mr. Van Schoick succeeds Dr. John E. Davis who has retired.

After graduation from Wesleyan University and several years of teaching, Mr. Van Schoick entered Y.M.C.A. work where he served in the direction of the health and recreation programs and finally as executive director. During World War II, while serving in the Army, he organized the reconditioning program in Army hospitals of the second service command, which became the basis for the later development of the new medical rehabilitation program in VA.

After the war, he was granted leave of absence from the Y.M.C.A. to help VA develop a broader concept of medical rehabilitation, including corrective therapy and the other new therapies since established in VA.

In 1950, Mr. Van Schoick decided to remain with VA and was appointed a special assistant to the director of physical medicine and rehabilitation, working closely with Mr. Davis in the administration and development of the corrective therapy program and other aspects of the service.

REHABILITATION EXHIBIT WINS OKLAHOMA AWARD

For the first time, an exhibit on Physical Medicine and Rehabilitation has won first prize at the Oklahoma State Medical Association's convention. The top entry was a combined presentation by the Department of Physical Medicine and Rehabilitation, University of Oklahoma Medical Center; V.A. Hospital, Oklahoma City; and the Okmulgee Rehabilitation Center. It was selected from more than forty scientific exhibits at the convention held at Oklahoma City from May 6 to May 9. The winning exhibit featured a live demonstration of amputees and paraplegics. Dr. Herbert Kent of the University of Oklahoma; Dr. Ella May George of the VA; and Dr. Shelby G. Gamble of Okmulgee were in charge of the exhibit.

INDUCE PSYCHOTIC SYMPTOMS BY INJECTION

The injection of a protein substance taken from the blood of schizophrenia patients has induced symptoms of schizophrenia in two "mentally normal" persons according to a paper read by Dr. Robert D. Heath, chairman of the Department of Psychiatry at Tulane University, at the annual meeting of the American Psychiatric Association in Chicago on May 3.

According to the report the tests were conducted on two inmates of the Angola State Penitentiary, Louisiana, who volunteered for the experiment. After the injection, observers said that each man exhibited schizophrenic symptoms although there was a marked difference in type. One of the prisoners appeared to enter a catatonic state while the other exhibited paranoid symptoms of suspiciousness with ideas of reference.

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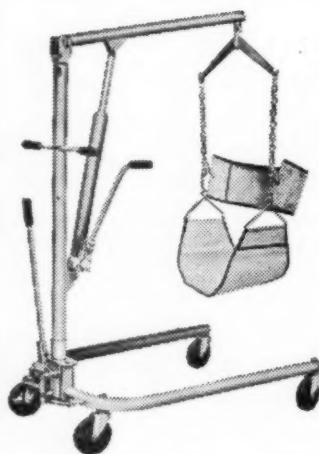
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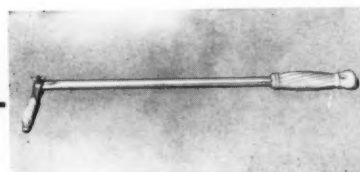
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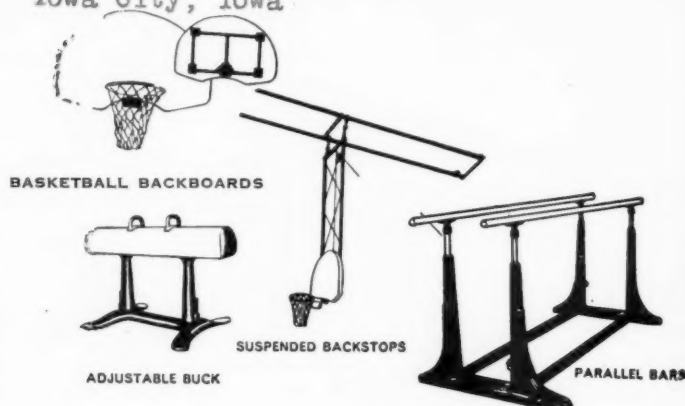
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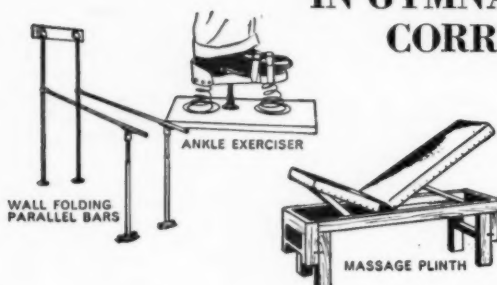
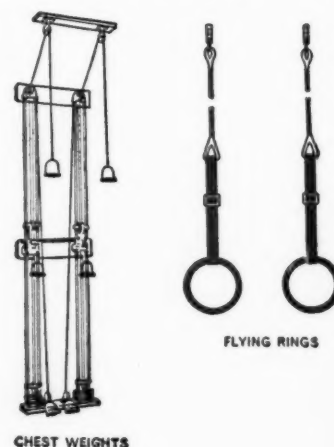
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